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EXERCISE DESERT ROCK LAS VEGAS NV
EXERCISE DESERT ROCK VII AND VIII. ANNEX L.(U)
1957

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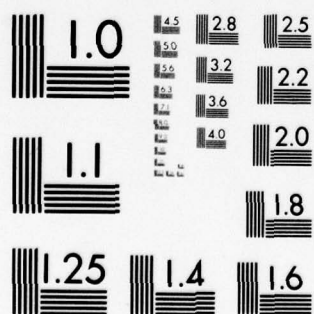
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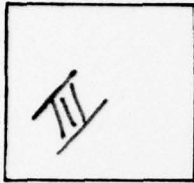


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Desert Rock Exercise VII and VIII
Final Report Annex L 1957
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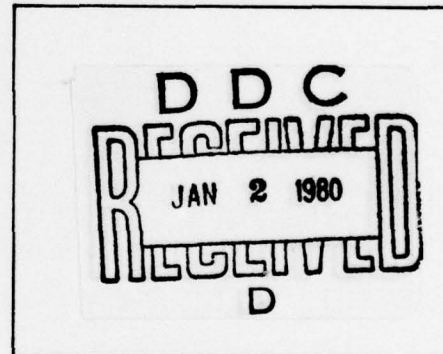
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RECOMMENDED FORMAT FOR PRINTING OF PHOTOS

It is recommended that the pre-detonation and post-detonation photos contained in this Annex be printed as indicated on the attached format. Each photo has been labeled to show photo number and before or after as appropriate. The words BEFORE and AFTER are used for brevity.

An alternate system of printing photos which would conserve bulk, space, and facilitate ease of reference is shown in the alternate format. However, it is not considered as practical from a production standpoint.

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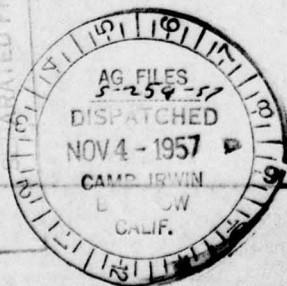
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ITEM	YARDS FR GZ	ORIENTA- TION	DAMAGE		DESCRIPTION OF ACTUAL DAMAGES
			PREDICTED	ACTUAL	
Truck, 1/2 ton	000	Head On, Surface	Severe	Severe	Hood torn off; seats ripped out; paint scorched; engine parts cracked and require replacing; displaced several yards.

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ANNEX L
TO FINAL REPORT
EXERCISE DESERT ROCK
VII and VIII



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General View

of

ATOMIC BURST

"FRISCILLA"

39 KT

700' Balloon

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General View

of

ATOMIC BURST

"SMOKY"

45 KT

700' Tower

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General Information

The purpose of displaying the various types of field equipment shown herein was to afford all participating troops and official observers reporting to Camp Desert Rock, Nevada, and opportunity to gain an appreciation of the effects of an atomic detonation on various types of field equipment.

The two atomic detonations considered in this report represent the only shots in which field equipment peculiar to the services was displayed solely for the express purpose of indoctrinating official observers and troop participants on the effects of an atomic detonation. Originally, at the beginning of the exercise, equipment display was planned for four shots as follows:

<u>Shot</u>	<u>Desired Yield</u>	<u>Type</u>
PRISCILLA	40 KT	700' Balloon
SHASTA	12 KT	500' Tower
SMOKY	45 KT	700' Tower
NEWTON	50 KT	1500' Balloon

However, due to numerous delays and changes in shot schedules only "PRISCILLA" and "SMOKY" could be utilized in conjunction with the observer program.

Approximately 1325 observers and troop participants were afforded the opportunity to observe the pre and post shot equipment display area during shot "PRISCILLA", and 920 during shot "SMOKY". All observers reporting to Camp Desert Rock for other than the above shots were escorted on a conducted tour of the "PRISCILLA" post shot equipment display area to view the effects of a 40 KT atomic detonation on service equipment.

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Assignment of real estate for the purpose of display of equipment was made by AEC, Camp Mercury, Nevada. Actual positioning of equipment in the vicinity of ground zero, and within the real estate boundaries allocated, was determined by the Deputy Exercise Directors Staff. In no case was any equipment placed further than 2500 yards from ground zero. All equipment was placed at varying orientations to ground zero, and in some cases, dug-in or placed in defilade on the surface of the ground. Defilade protection was effected in shot "SMOKY" only.

The atomic shot "PRISCILLA", which was detonated at Frenchman's Flat in the Nevada Test Site on 24 June 1957, indicated the effects on equipment over extremely flat uninterrupted terrain of ideal surface conditions. The atomic shot "SMOKY", detonated in the Yucca Flat area on the Nevada Test Site on 31 August 1957, presented terrain conditions of both the flat surface conditions and the "hill and dale" or interrupted surface effect. Results of these conditions imposed on effects on various types of field equipment from an atomic detonation are contained herein.

Damage prediction computations are based strictly on the use of formulas and iso-damage curves in TM 23-200, Capabilities of Atomic Weapons. Damage levels are in accordance with criteria established in paragraph 56, page 255 of the manual.

Equipment selected for prediction of damage was selected at random without any attempt being made to position equipment within an assured damage level.

In the case of shot "PRISCILLA", a review of predicted and actual damage reveals almost 100 percent prediction of the damage actually sustained. This was relatively simple since terrain was flat and without obstruction

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and straight line interpolation could be made for intermediate distances from ground zero to target. The foregoing can be applied equally as well to the administrative display of equipment in shot "SMOKY". However, prediction of damage, in the case of equipment displayed tactically in "SMOKY", was not as successful. This was not due however, to erroneous results of computations based on TM 23-200, but rather on the belief that equipment was in full defilade when actually it was not. Subsequent computations, based on equipment being in partial defilade, supported these findings. It is of importance to note that equipment positioned in partial defilade suffered predicted severe damage to the exposed portion and light damage to the lower or protected portion of the equipment. Actual on the ground evaluation readily supported the rule, in predicting damage, to modify predictions of damage by reducing by two levels in the case of severe, and by one level in the case of moderate when equipment is in full defilade. This theory was fully correct in those cases where equipment was in complete defilade.

Damage predictions to drag sensitive targets based on damage criteria in TM 23-200 can be employed with excellent reliability. Secondary tests conducted to predict thermal damage to heat susceptible targets also produced excellent reliability.

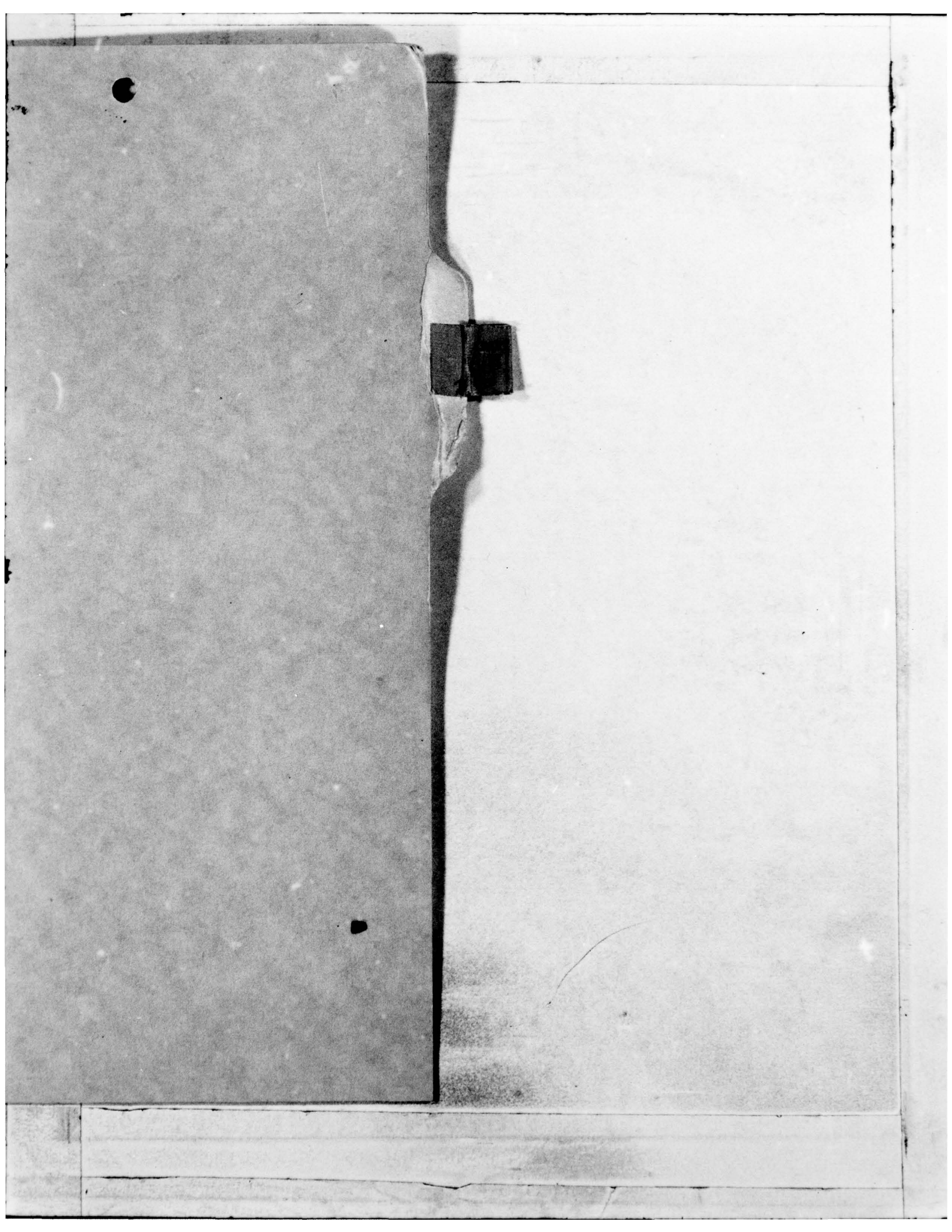
All photos of equipment and resultant damage were taken in almost all cases, on a line between ground zero and the item being photographed.

Requirements for additional prints of photos contained herein should be forwarded to the following agency:

Army Photographic Agency
Room 5A 474
The Pentagon
Washington 25, D. C.

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Technical Considerations
Shot "PRISCILLA"
(Shot Day - 24 June 1957)

Design Yield - 40 KT ^{00E}

Actual Yield - 39 KT

Ht of Burst - 700 Feet

Time of Burst - 0445 Hours

Temperature - 17°C

Air Density - 910 mb

Elevation - 3776 Feet Above MSL (Burst Point)

Humidity - 29 Percent

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DYNAMIC PRESSURES

60 psi	-	480 Yards
40 psi	-	545 Yards
20 psi	-	665 Yards
15 psi	-	720 Yards
10 psi	-	800 Yards
5 psi	-	990 Yards
2 psi	-	1230 Yards
1 psi	-	1490 Yards

THERMAL RADIATION

60 cal/cm ²	-	1250 Yards
40 cal/cm ²	-	1550 Yards
30 cal/cm ²	-	1775 Yards
20 cal/cm ²	-	2200 Yards
10 cal/cm ²	-	3050 Yards
5 cal/cm ²	-	4200 Yards

All computations to arrive at predicted damage was based on scaling laws and damage curves in TM 23-200, Capabilities of Atomic Weapons, exclusively.

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EQUIPMENT DISPLAY AREA

Shot "PRISCILLA"

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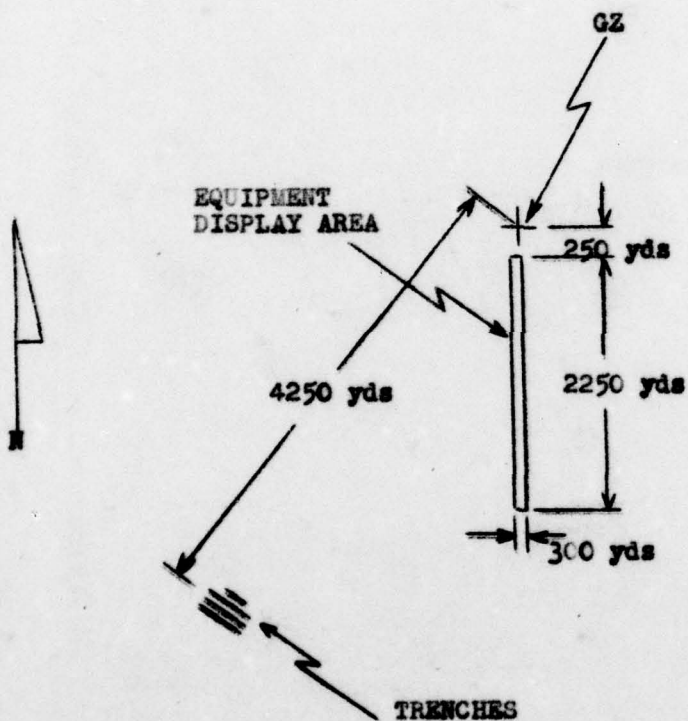
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Map: NEVADA, 1:50,000
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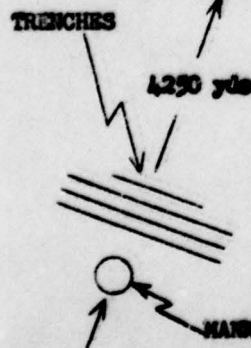
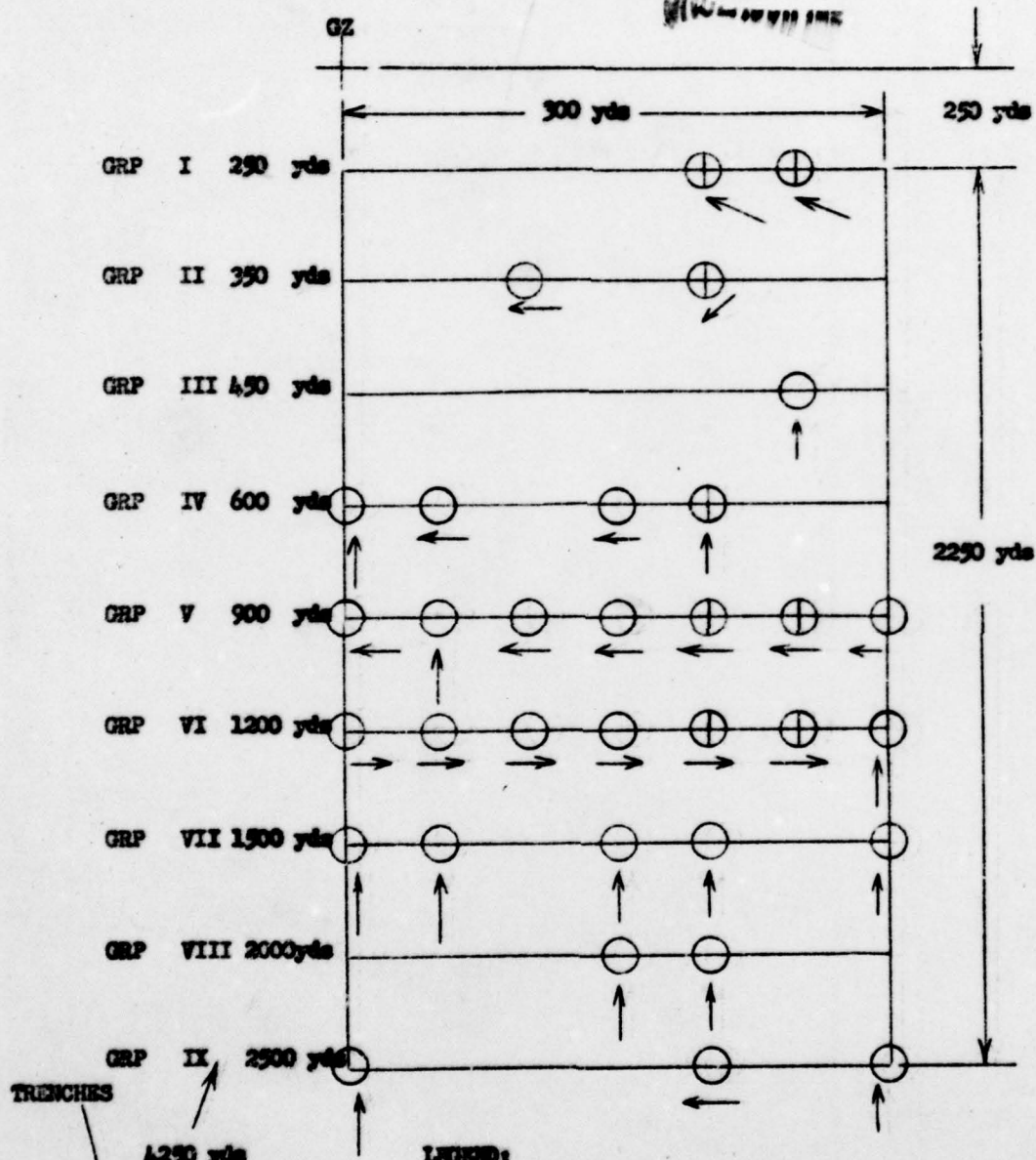
TRENCHES
6' Deep
2' Wide
100 Yds long (Comd trench)
325 Yds long (each observer trench)
100' Between trenches

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EQUIPMENT DISPLAY AREA SHOT "PRISCILLA"



LEGEND:

- INDICATES ITEM ON DISPLAY ON SURFACE
- ⊕ INDICATES ITEM DUG-IN
- ← INDICATES ITEM FACING SIDE ON
- ↑ INDICATES ITEM FACING HEAD-ON

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EQUIPMENT DISPLAY
Shot "PRISCILLA"

GP	ITEM	YARDS GZ	PREDICTED DAMAGE	ACTUAL DAMAGE
I	Mortar, 81mm	300	Severe	Moderate
	Tank, M24	345	Severe	Severe
II	Tank, M4	364	Severe	Severe
	Truck, 2 1/2 ton	380	Severe	Severe
III	Truck, 2 1/2 ton	515	Severe	Severe
IV	Tank, M4	600	Moderate	Light
	Tractor, Engineer	602	Severe	Severe
	Crane, shovel	618	Severe	Severe
	Cans, gas 5 gal	632	Light	Light
V	Truck, 2 1/2 ton	900	Severe	Severe
	MG, cal 30	902	Mod-lt	Moderate
	Truck, 1/2 ton	906	Severe	Severe
	Tank, M24	912	Moderate	Moderate
	MG, Cal 30	915	Light	Light
	Truck, 1/2 ton	922	Light	Light
	Carrier, M29c	950	Severe	Severe
VI	MG, Cal 50	1200	Light	Light
	Trailer, 1 ton	1202	Moderate	Light
	Truck, 1/2 ton	1205	Moderate	Moderate
	Truck 2 1/2 ton	1210	Moderate	Moderate
	Truck, 1/2 ton	1215	Mod-lt	None
	Truck, 3/4 ton	1225	Mod-lt	Light
	Tank, M24	1242	Mod-lt	Light
VII	Mannequin, Stdg.	1500	Destroyed	Destroyed
	Mortar, 81mm	1500	Light	Light
	Tank, M4	1508	Light	Light
	Gun, 57mm AT	1512	Light	Light
	Mannequin, Prone	1528	Destroyed	Destroyed
VIII	Tractor, dozer	2000	Light	None
	full truck			
	Gun, 40mm AAA	2010	Light	None
IX	Mannequin, Standing	2500	Scorched	Destroyed
	Truck, 1/2 ton	2510	Light	Light
	Mannequin, Prone	2515	Singed	Singed
Trenches	Mannequin	4250	None	None

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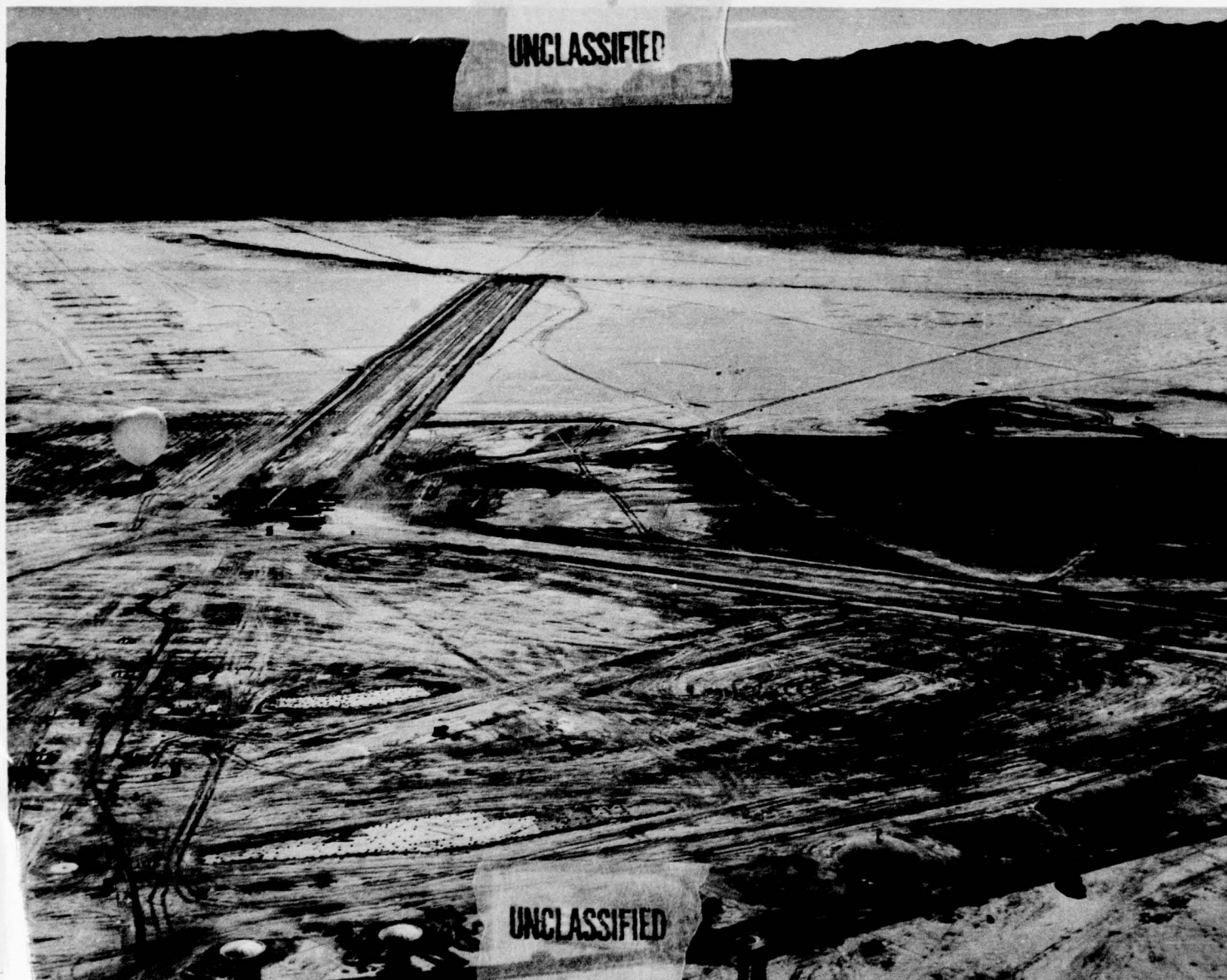
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"PRISCILLA"

and

Equipment Display Area

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DAMAGE COMPARISON

PREDICTED VS ACTUAL

Shot "PRISCILLA"

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DEFINITION
OF
DAMAGE

- LIGHT** - Damage which does not interfere with immediate military operations, but necessitates some repair to restore the items complete military usefulness.
- MODERATE** - Damage which is sufficient to prevent any military use until some repairs are effected.
- SEVERE** - Damage whenever repair is essentially impossible without removal to a major repair facility.

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Comparison Chart

EXERCISE DESERT ROCK VII and VIII

SHOT: Priscilla

ANTICIPATED YIELD: 40 KT

ACTUAL YIELD: 39 KT

PHOTO REF. NR.	ITEM	DISTANCE From GZ (Yards)	ORIENTATION & PROTECTION	DAMAGE CLASSIFICATION		DESCRIPTION OF ACTUAL DAMAGES
				PREDICTED	ACTUAL	
1	Mortar, 81mm	300	45° dug in below surface	Severe	Severe	Weapon blown out of hole and blistered; tripped broken; Elevating knob bent.
2	Tank, M-24	345	45° dug in below surface	Severe	Severe	Turret blown 90 feet; tracks blown off; whole frame caved in.
3	Truck, 2½ ton	380	45° left dug in below surface	Severe	Severe	Twisted wreckage; tires blown off; laying on side; cab demolished.
4	Truck, 2½ ton flame thrower	515	Head on, surface	Severe	Severe	Demolished; scattered 100 yards.
5	Tank, M-4	600	Head on, surface	Moderate	Light	Tank displaced approximately 10 feet; paint scorched on GZ side and front; front fenders bent in. Tank reusable.
6	Tractor D-8, full track	602	Side on, surface	Severe	Severe	Tractor displaced 100 feet and tipped upside down; engine blown free of chassis; parts of tractor blown from 650 yd. marker to 900 yard marker.

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PHOTO REF. NR.	ITEM	DISTANCE From GZ (Yards)	ORIENTATION & PROTECTION	DAMAGE CLASSIFICATION		DESCRIPTION OF ACTUAL DAMAGES
				PREDICTED	ACTUAL	
7	Crane, shovel	618	Side on, Surface	Severe	Severe	Main portion of crane assembly displaced approximately 50 feet; one track blown off; super structure collapsed; cab blown into sections and displaced up to 400 yards; operator seat displaced 50 yards; main assembly toppled upside down; crane displaced in sections up to 200 yards to rear.
8	Gun, gas 5 gal	632	Edge on, dug in below surface	Light	Light	Hole filled in; no noticeable damage.
9	Tank, M-4	364	Side on, Surface	Severe	Severe	Turret blown 100 feet; tank turned upside down; track blown off.
10	Truck, 2 1/2 ton	900	Side, surface	Severe	Severe	Truck bed blown off and displaced approximately 300 yards to the rear; one wheel displaced 200 yards; one fender displaced 100 yards to the rear; one complete set of dual wheels and axle displaced 75 yards over a dike; chassis completely buckled and displaced 75 yards; engine blown from chassis and laying 10 feet from chassis.

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PHOTO REF. NR.	ITEM	DISTANCE From GZ (Yards)	ORIENTATION & PROTECTION	DAMAGE CLASSIFICATION		DESCRIPTION OF ACTUAL DAMAGES
				PREDICTED	ACTUAL	
11	Machine gun, cal 30	902	Head on, surface	Moderate - light	Light	Barrel assembly displaced 75 yards to the rear; tripod displaced 75 yards to rear and one leg bent.
12	Truck, 1/4 ton	906	Side on, surface	Severe	Severe	Body displaced 150 yards to the rear; radiator and grill displaced 100 yards to the rear, engine displaced 125 yards; parts of body, engine and fender displaced 230 yards to the rear transfer case and one wheel displaced 100 yards.
13	Tank, M-24	912	Side on, Surface	Moderate	Moderate	Tank tipped upside down; damage to light metal full length of tank; no displacement apparent.
14	Machine gun, cal 30	915	Head on, dug in (parapet)	Light	Light	Blown back in hole; dirty.
15	Truck, 1/4 ton	922	Head on, dug in below surface	Light	Light	Hood open and bent; windshield bent back; hole filled with 2 feet of dirt.

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PHOTO REF. NR.	ITEM	DISTANCE From GZ (Yards)	ORIENTATION & PROTECTION	DAMAGE CLASSIFICATION		DESCRIPTION OF ACTUAL DAMAGES
				PREDICTED	ACTUAL	
16	Carrier, M-29C	950	Side on, surface	Severe	Severe	Overturned and rolled; destroyed; blown about 75 yards.
17	Machine gun cal 50	1200	Head on, surface	Light	Light	Gun blown off tripod; tripod displaced 4 feet to rear of gun.
18	Trailer, 1 ton	1202	Side on, surface	Moderate	Light	Trailer displaced 10 feet to the rear; paint scorched on bed side facing GZ; cloth covering chains riddled.
19	Truck, 1/4 ton	1205	Side on, surface	Moderate	Moderate	Windshield blown out; back end pushed in; left front fender broken loose at seam and flared up; battery case blown out and laying near jeep; hood buckled; paint scratched on side; back end of jeep displaced about 105°; driver's seat burned.
20	Truck, 2 1/2 ton	1210	Side on, surface	Moderate	Moderate	Truck bed bent on GZ side; hood collapsed; windshield frame buckled; truck displaced 2 feet to the rear; tappet cover blown loose from studs; paint scorched on GZ side; tires darkened but not damaged.

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PHOTO REF. NR.	ITEM	DISTANCE From GZ (Yards)	ORIENTATION & PROTECTION	DAMAGE CLASSIFICATION		DESCRIPTION OF ACTUAL DAMAGES
				PREDICTED	ACTUAL	
21	Truck, 1/4 ton	1215	Side on, dug in below surface	Light	None	Dirty.
22	Truck, 3/4 ton	1225	Side on, dug in below surface	Moderate - Light	Light	Windshield smashed (no glass) and frame bent; hole filled with about 1 1/2 feet of dirt; hood dented.
23	Tank, M-24	1242	Head on, surface	Light	Very Light	Blistered paint.
24	Mannequin	1500	Face on, upright	Destroyed	Destroyed	Fatigue trousers shredded; 2x4 frame (T) broken off and displaced 4 feet to the rear; pistol belt, first aid packet and belt scorched; fatigue jacket shredded and displaced about 40 feet to the rear along with a 4 feet length of 2x4; helmet liner displaced approximately 55 feet to the rear.
25	Mortar, 81mm	1500	Head on, surface	Light	Light	Gun tipped over to the rear.
26	Tank, M-4	1508	Head on, surface	Light	Very Light	Paint scorched on GZ side; no apparent displacement.

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PRE-SHOT

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PHOTOS

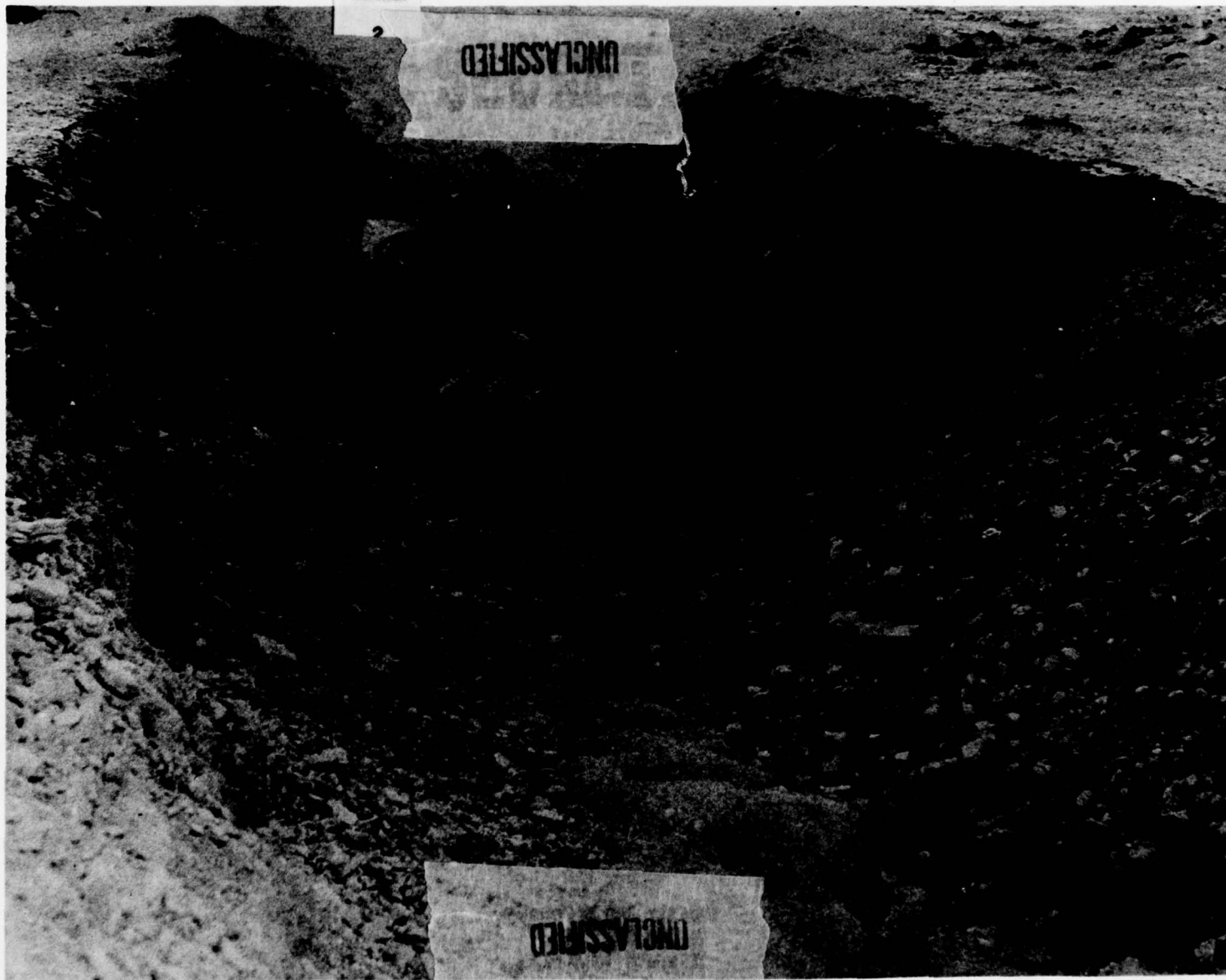
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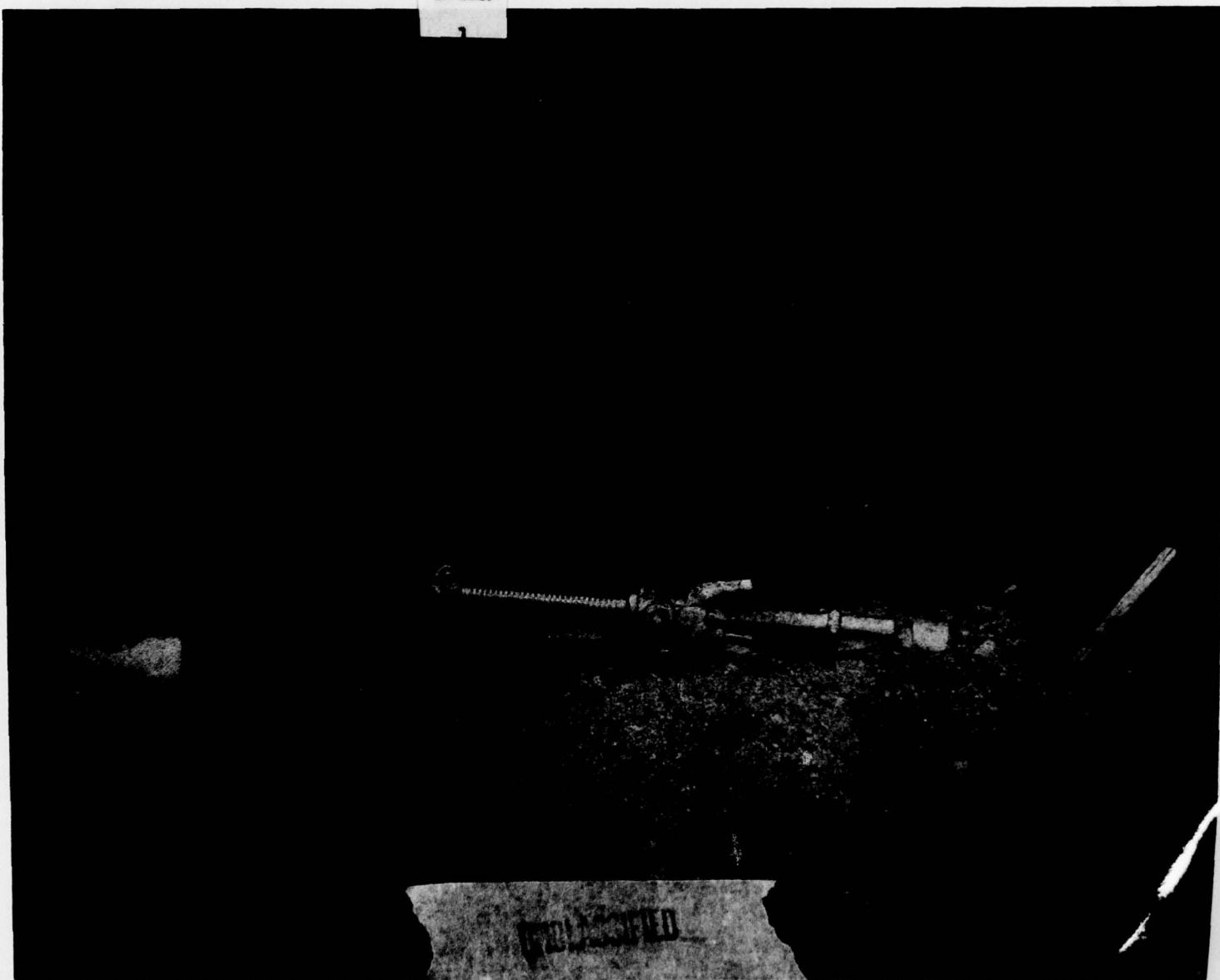
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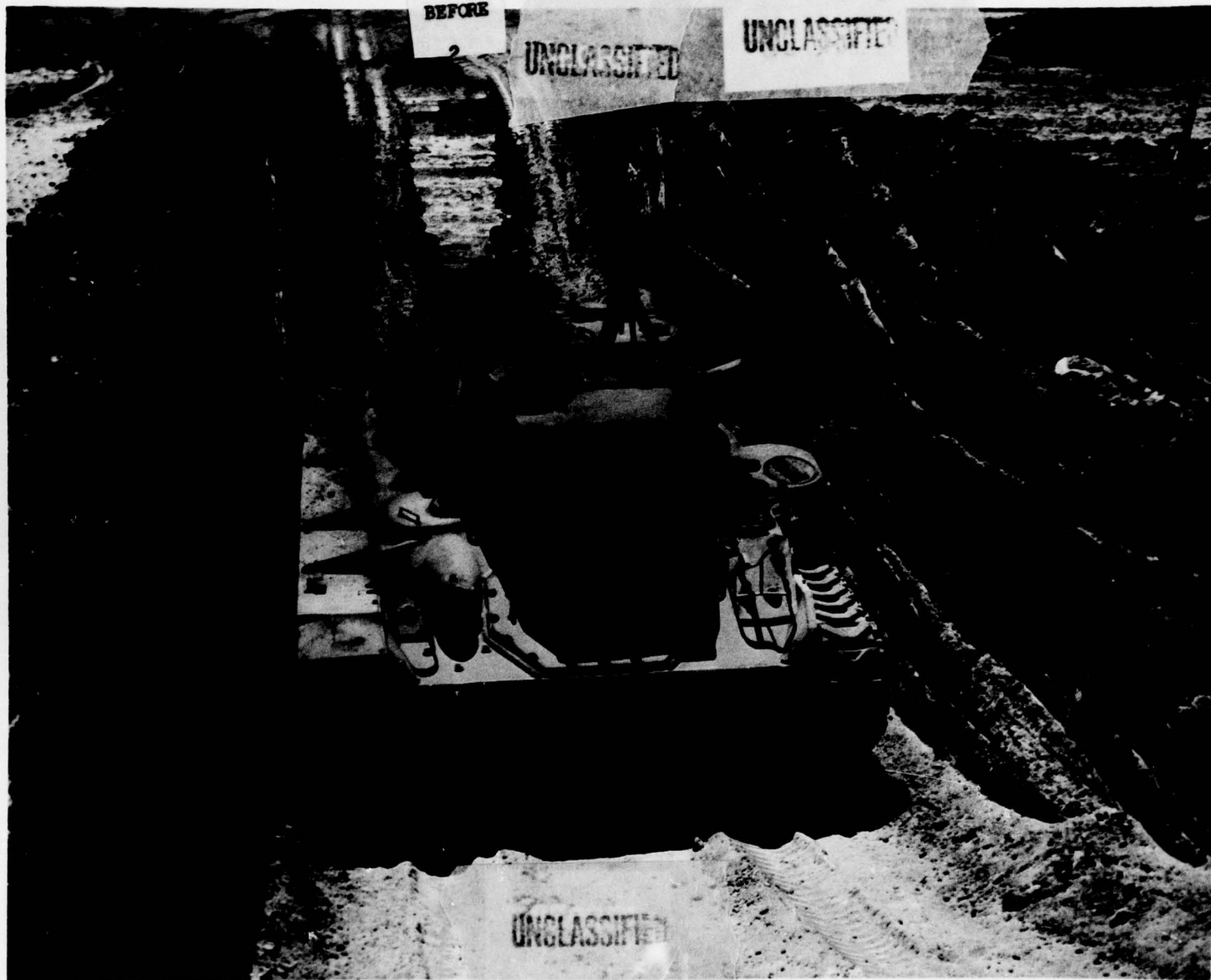


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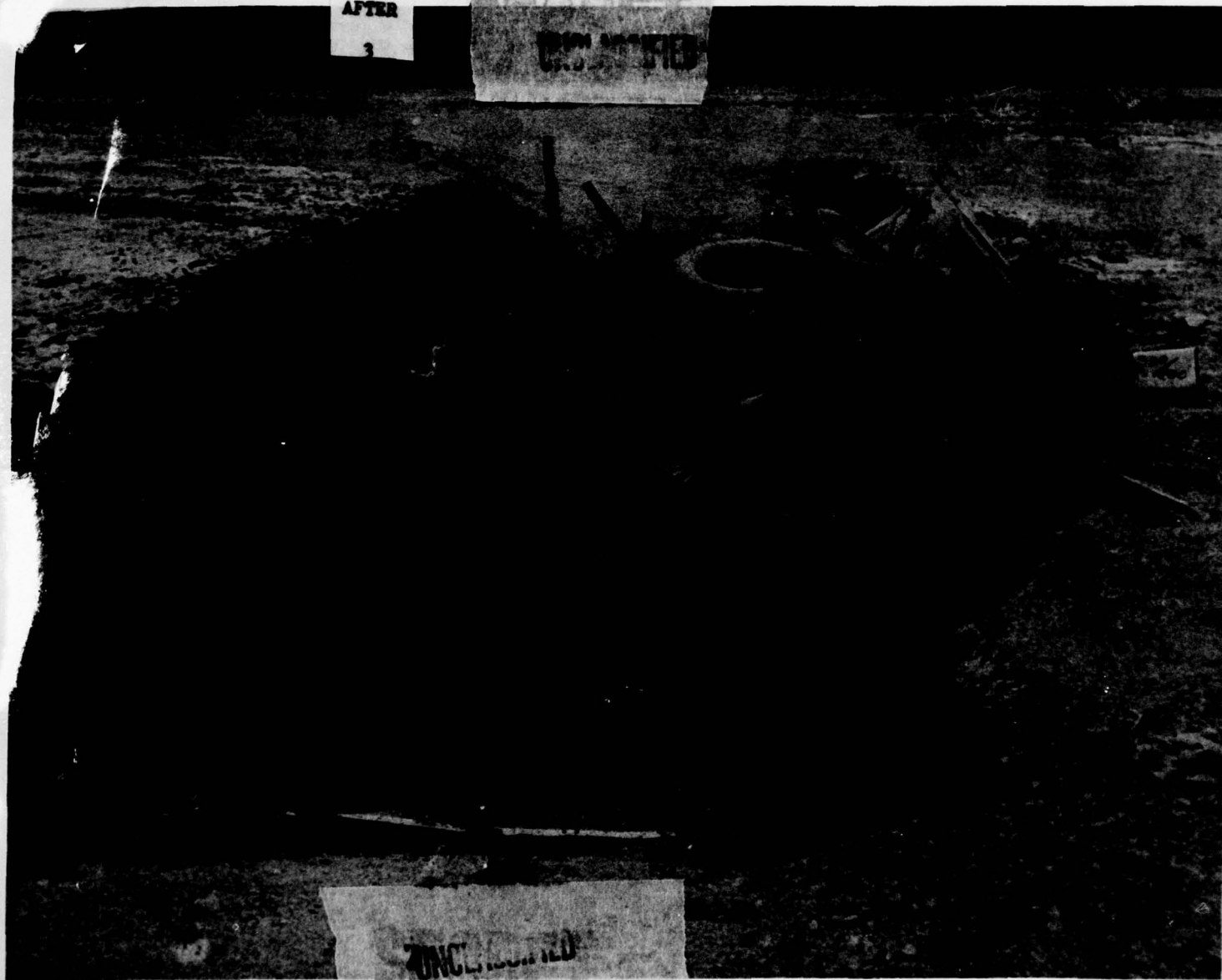


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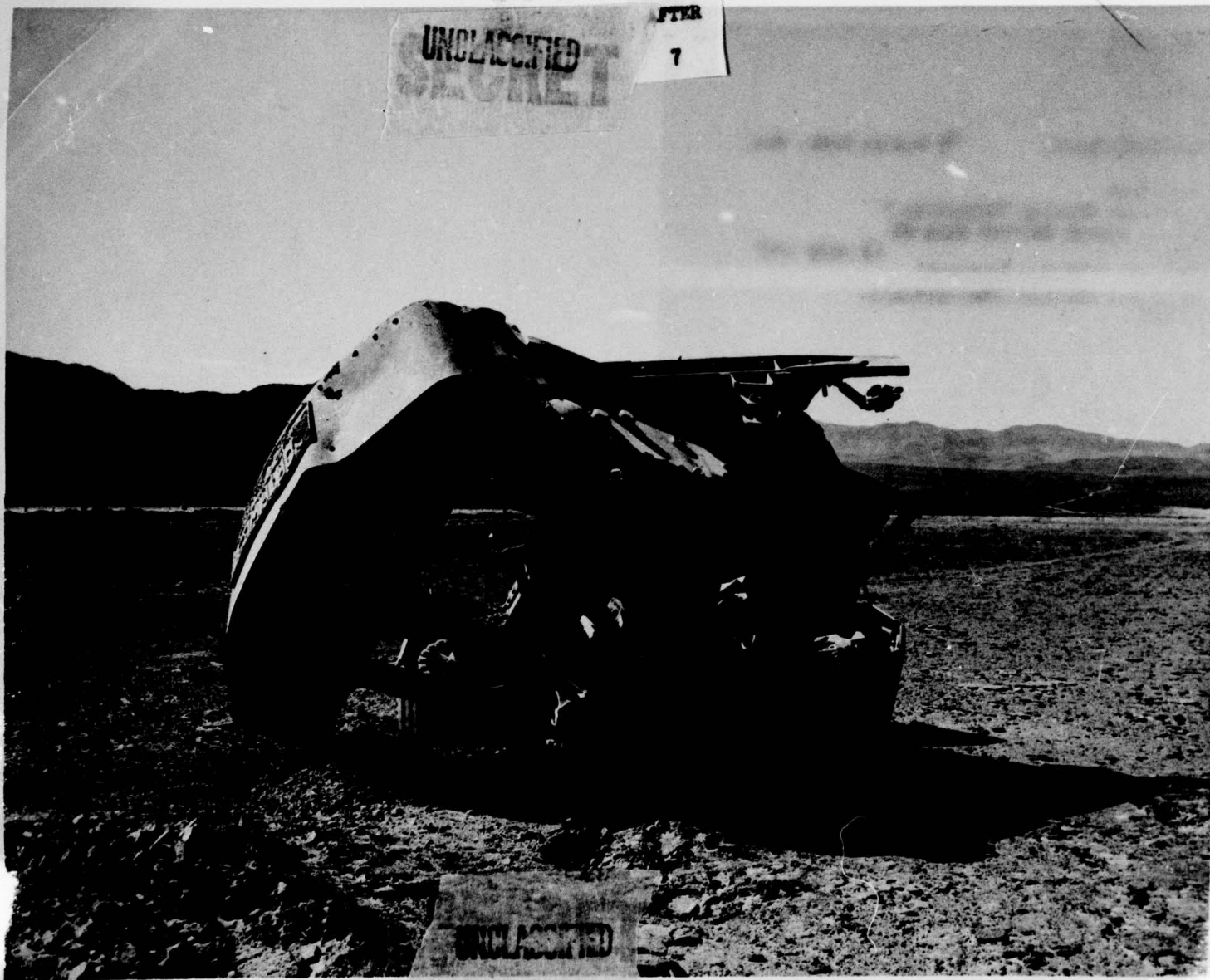


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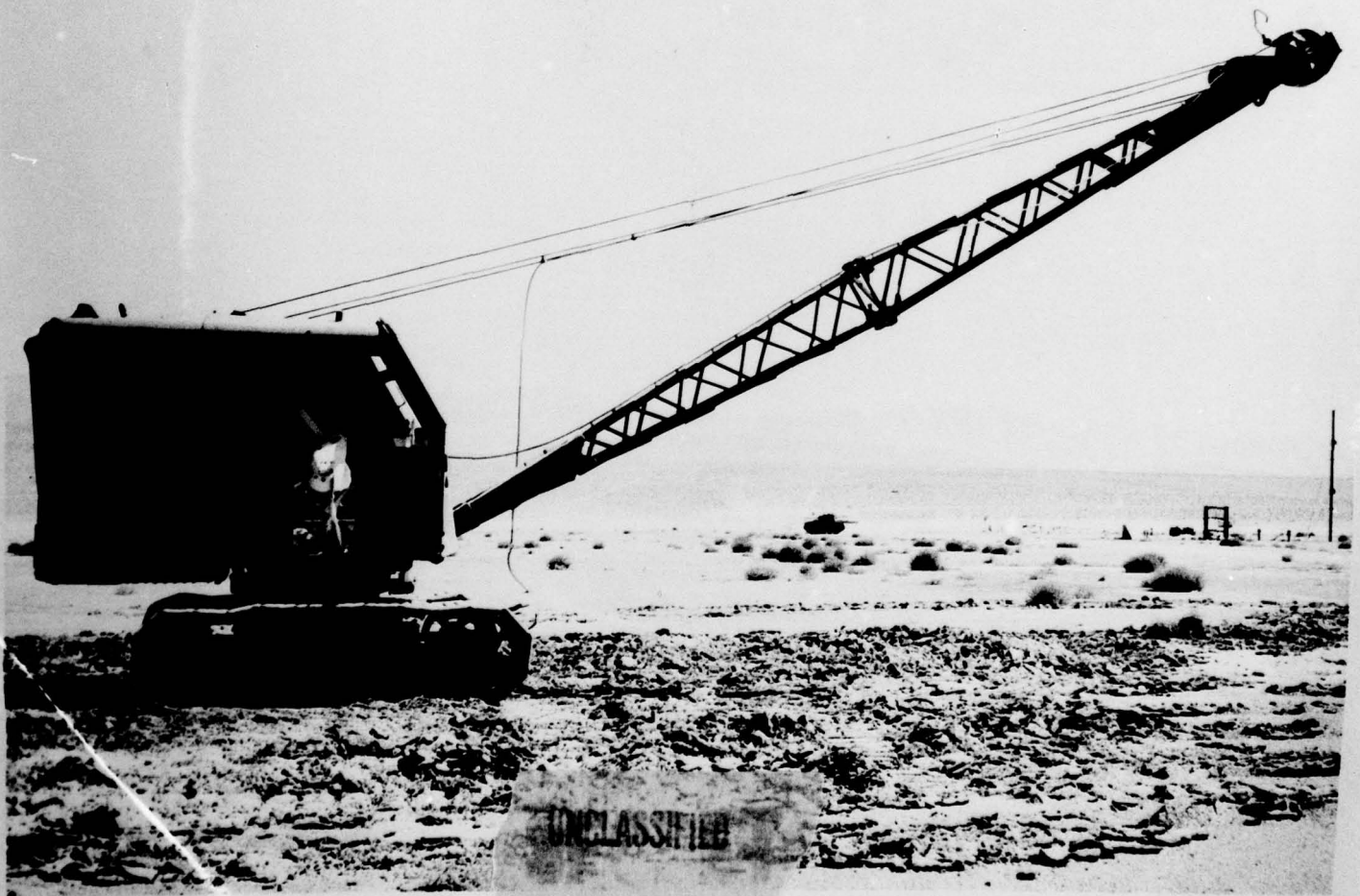
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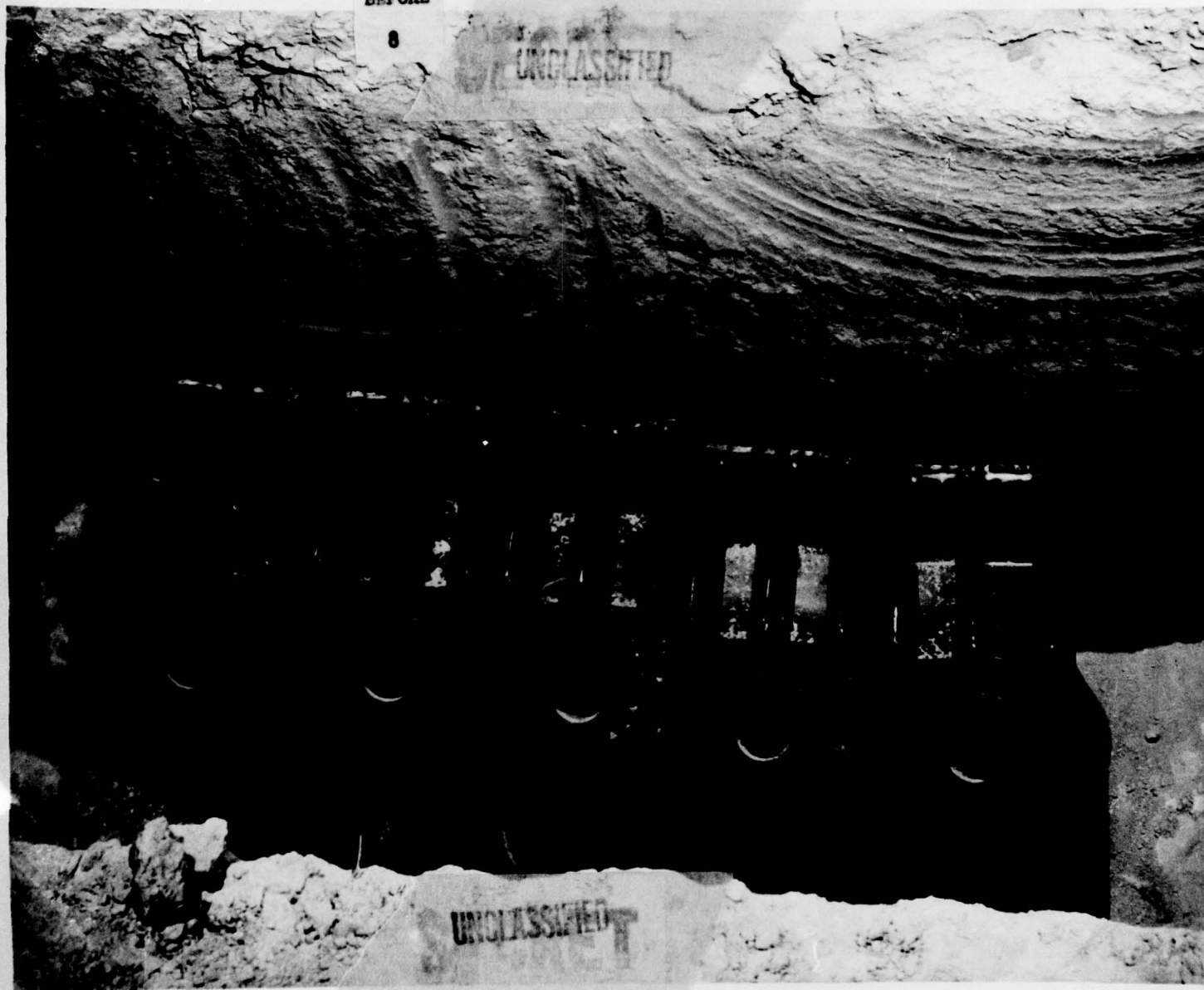
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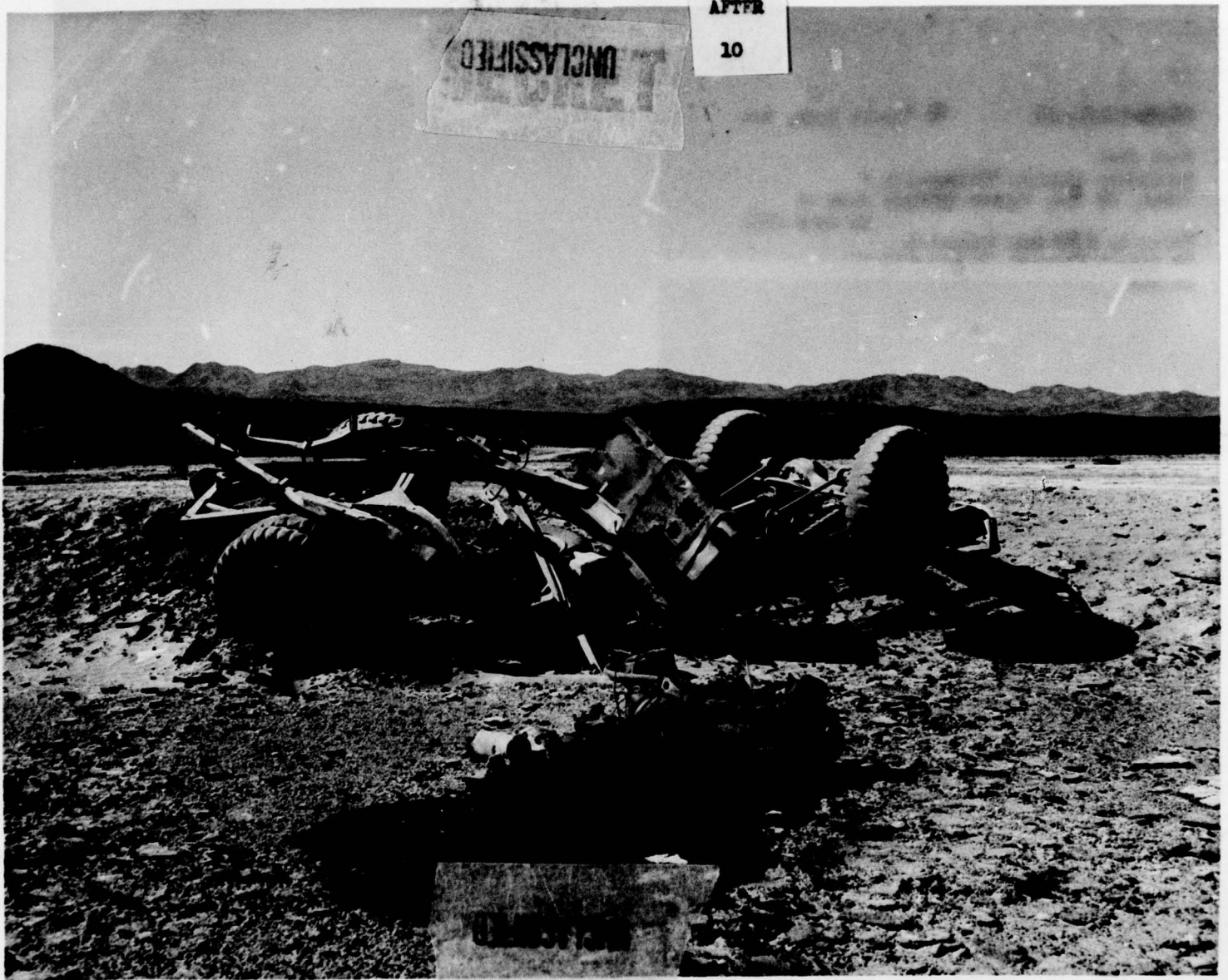
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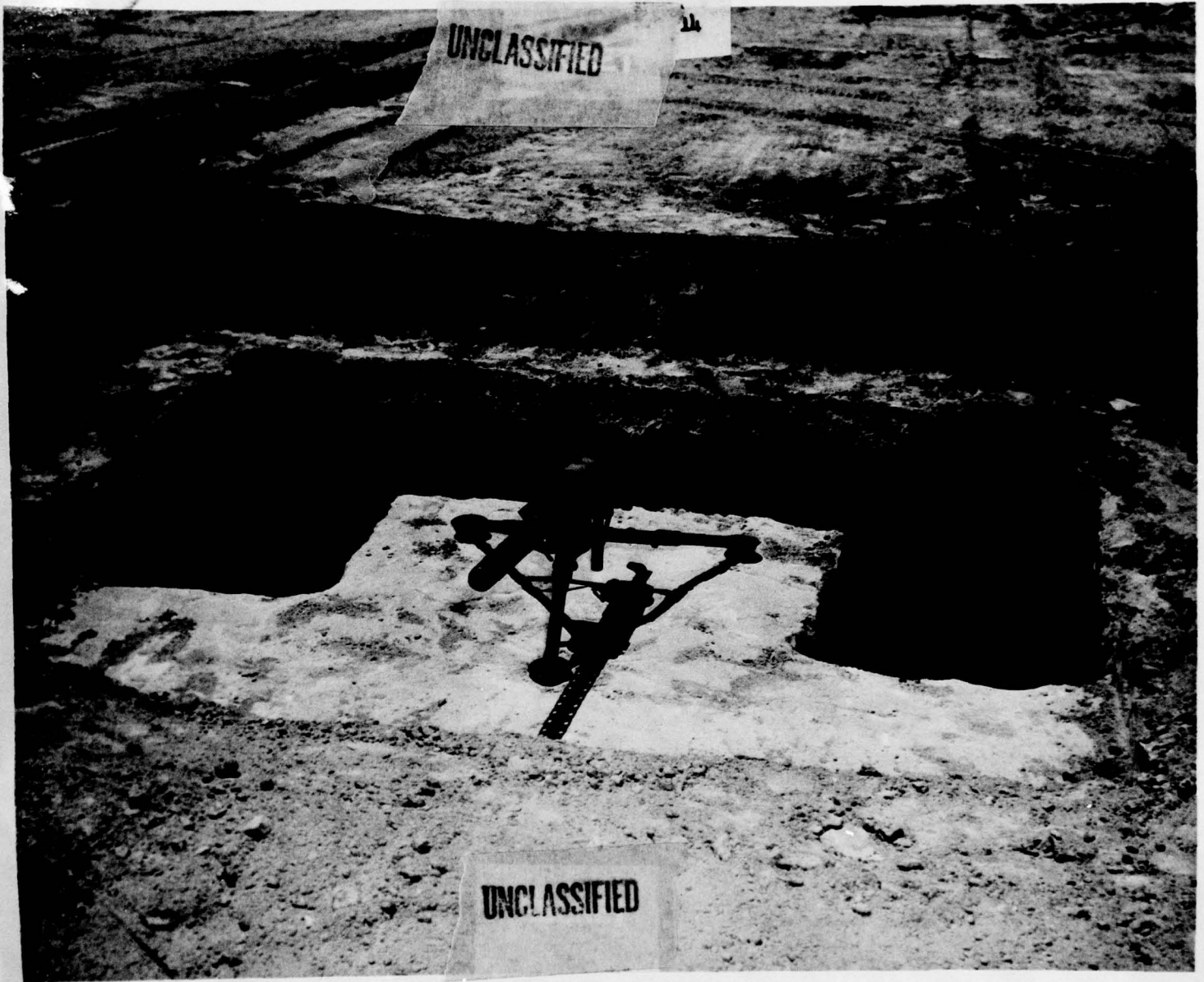
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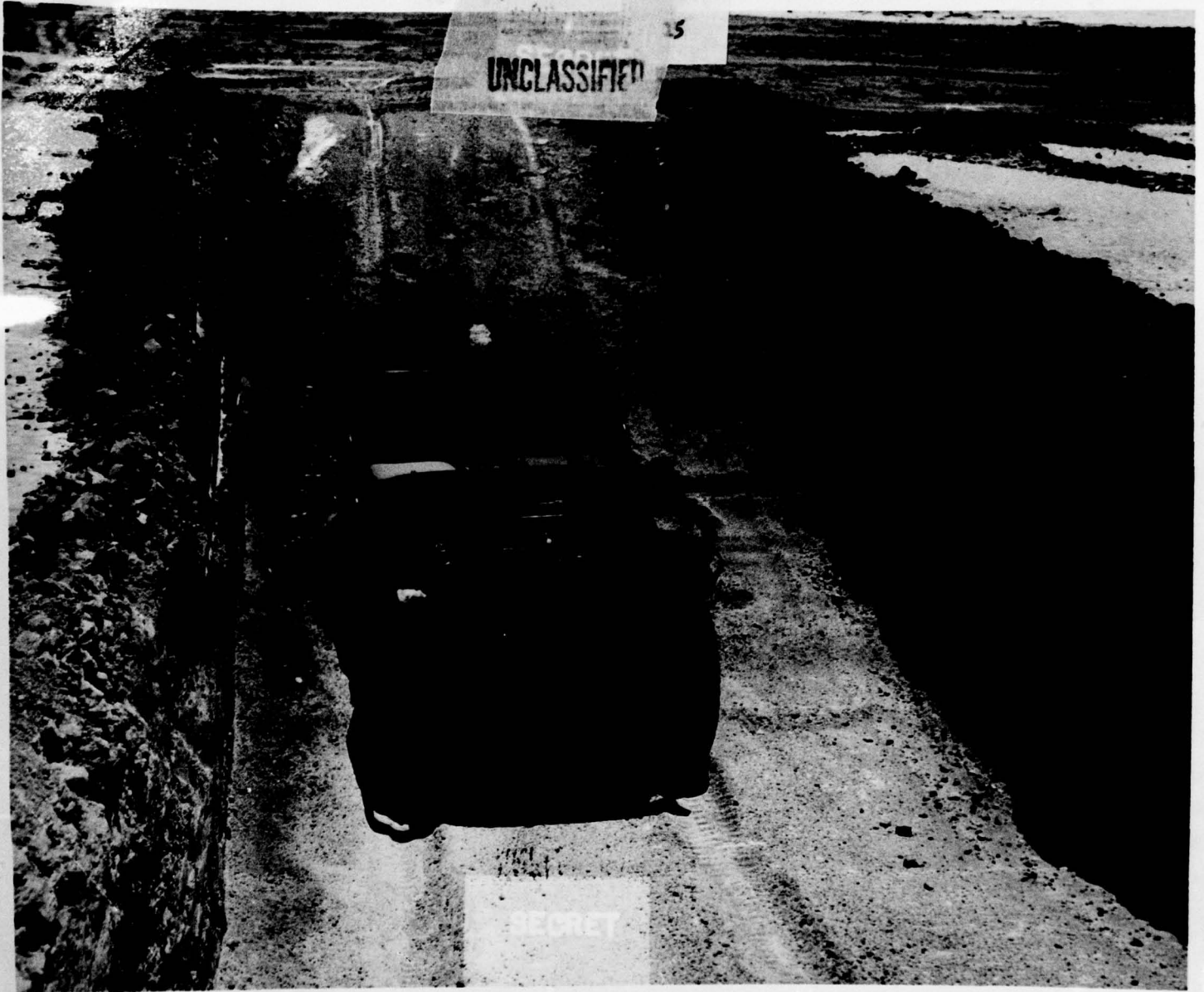
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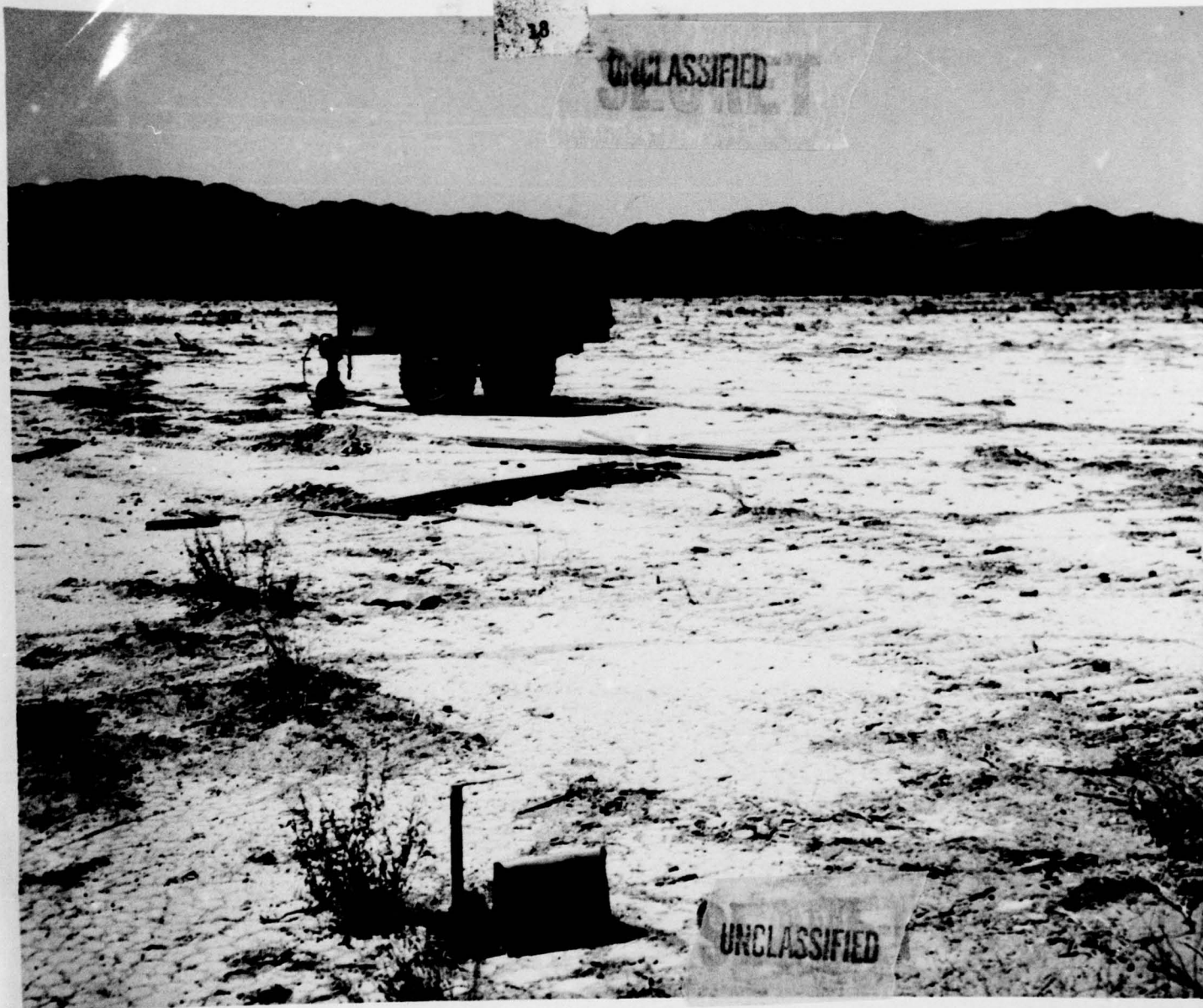
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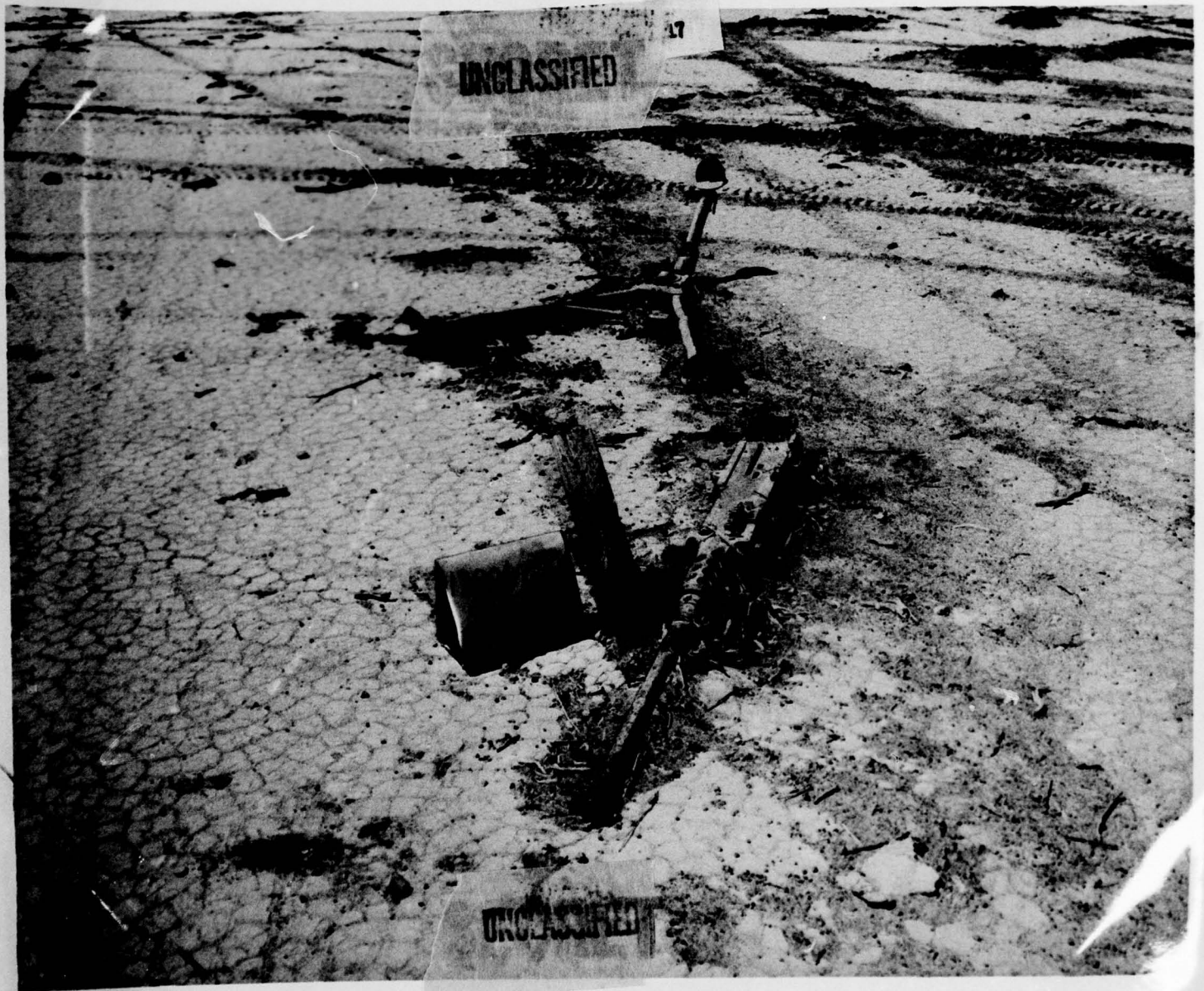
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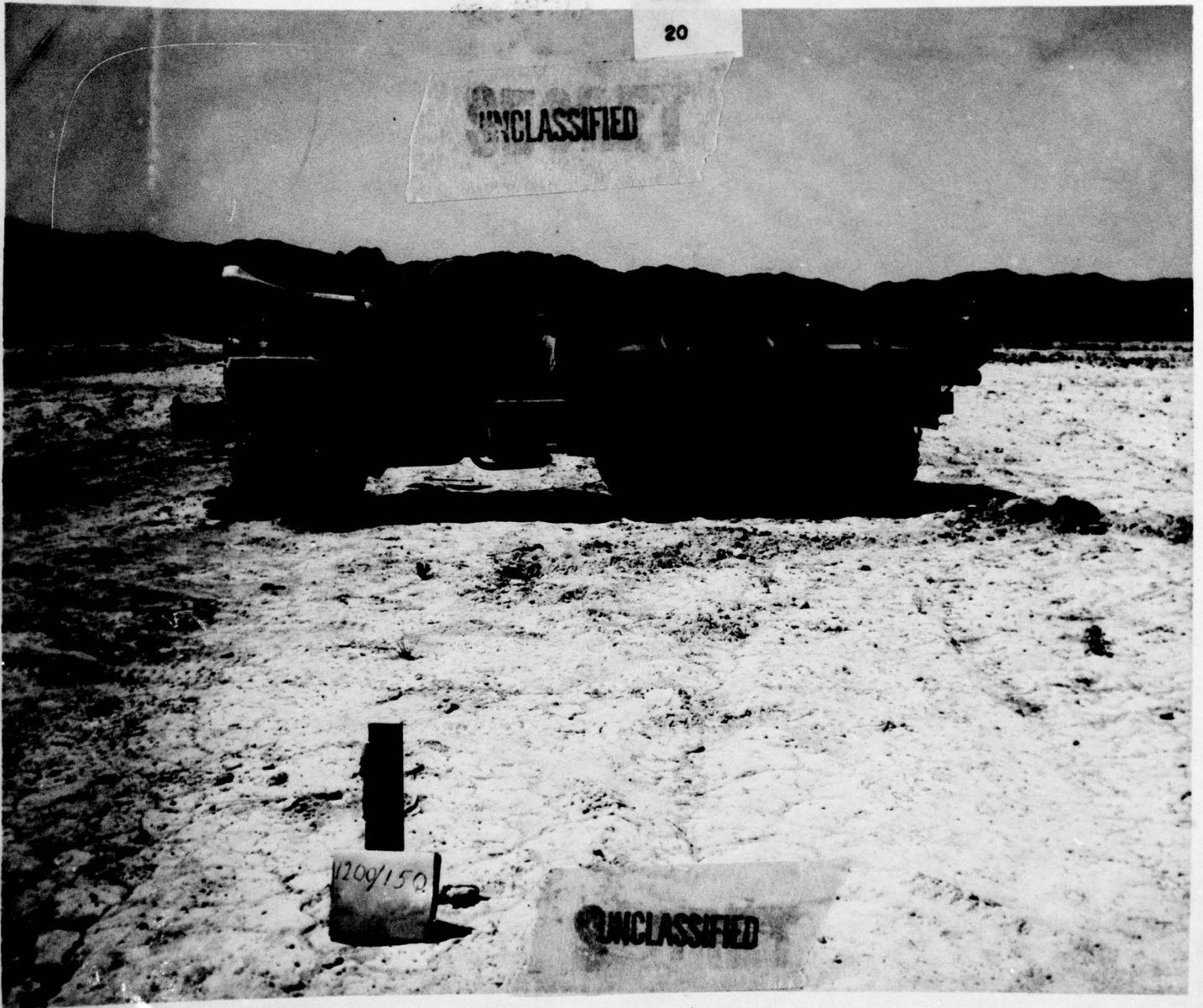
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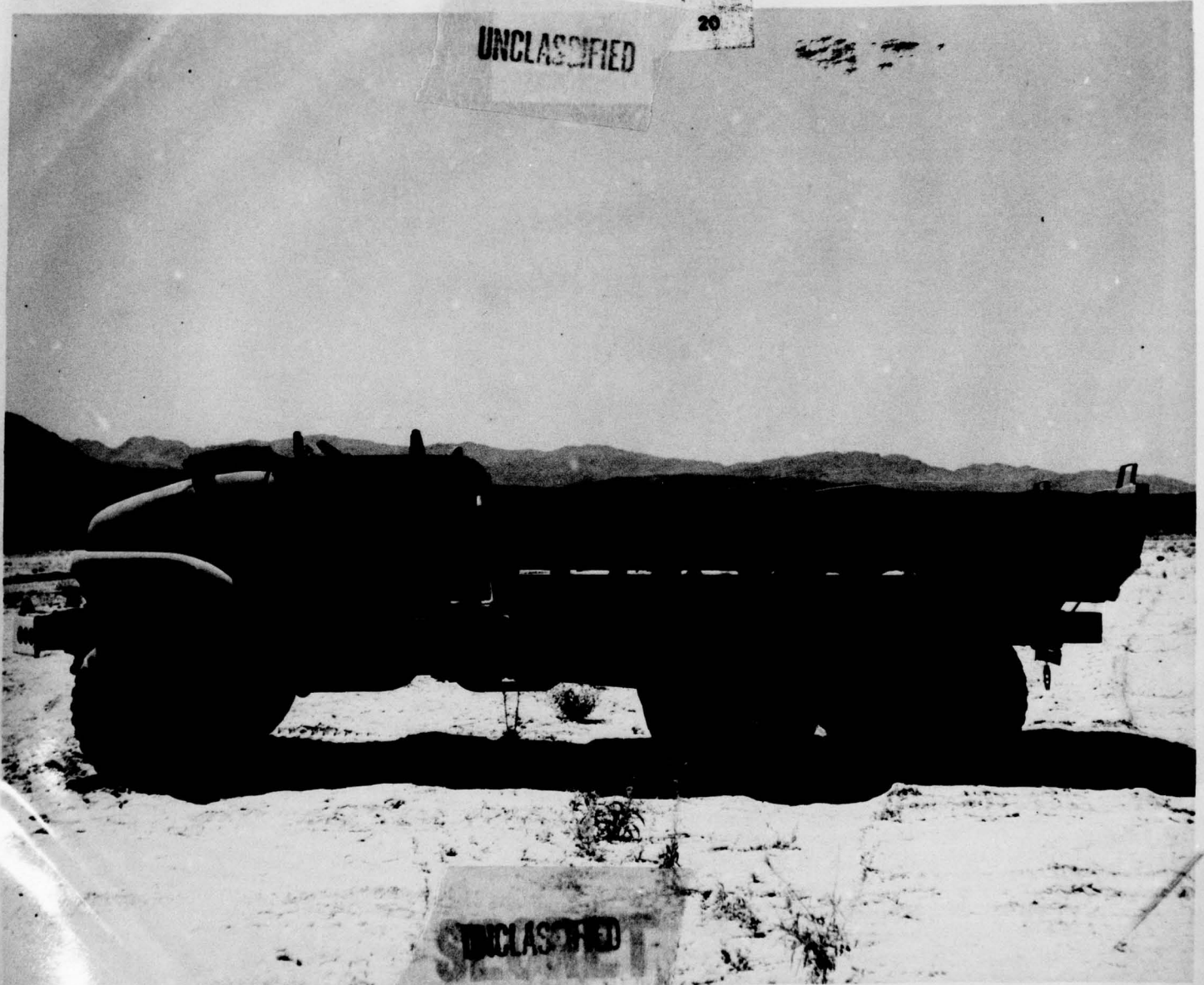


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AFTER

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AFTER

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BEFORE

21

UNCLASSIFIED



SECRET

BEFORE

22

UNCLASSIFIED

UNCLASSIFIED



AFTER

24

UNCLASSIFIED

1500/0

UNCLASSIFIED



AFTER

23

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BEFORE

23

UNCLASSIFIED



UNCLASSIFIED



BEFORE

24

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AFTER

26

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AFTER

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BEFORE

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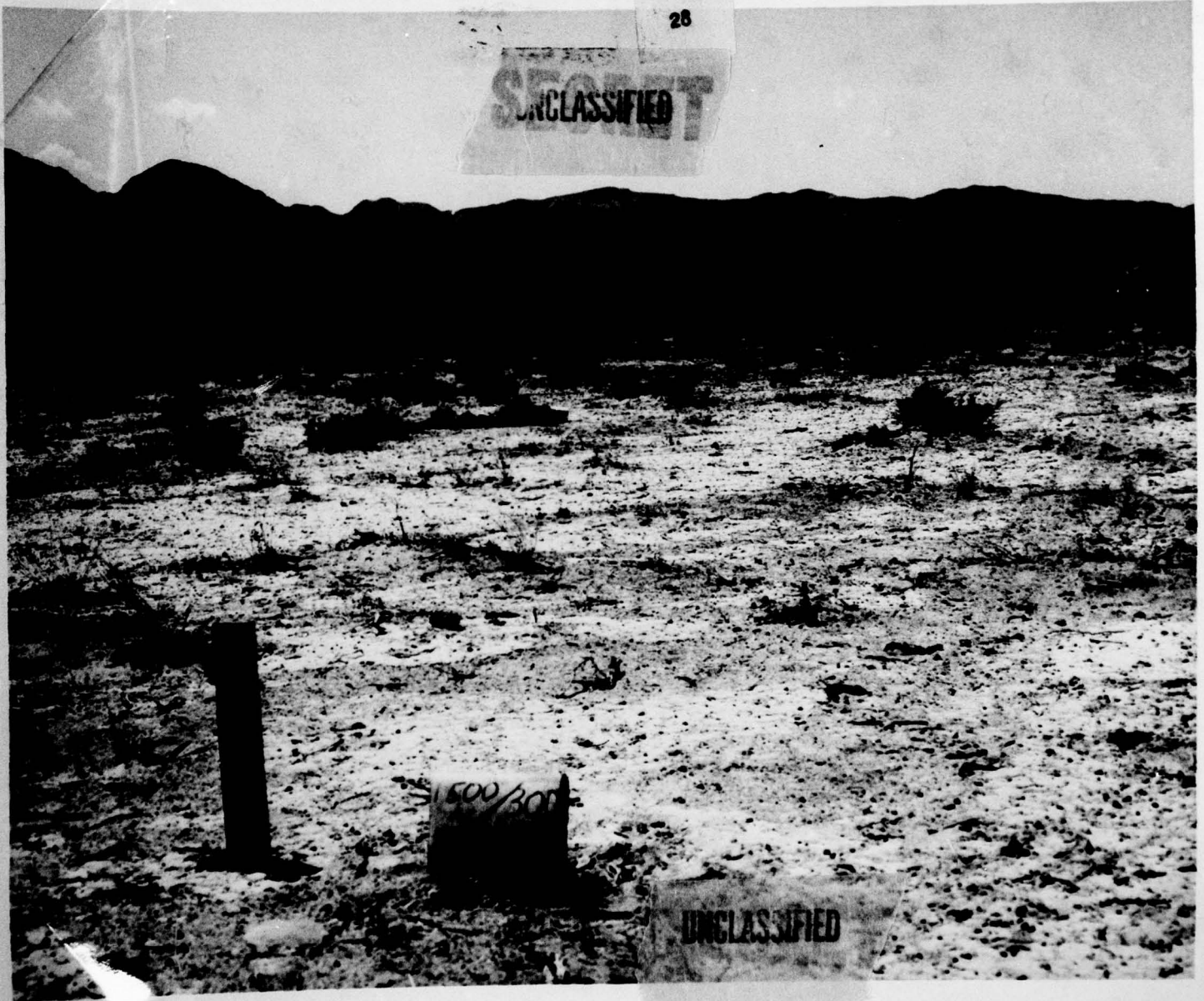


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AFTER

28

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AFTER

27

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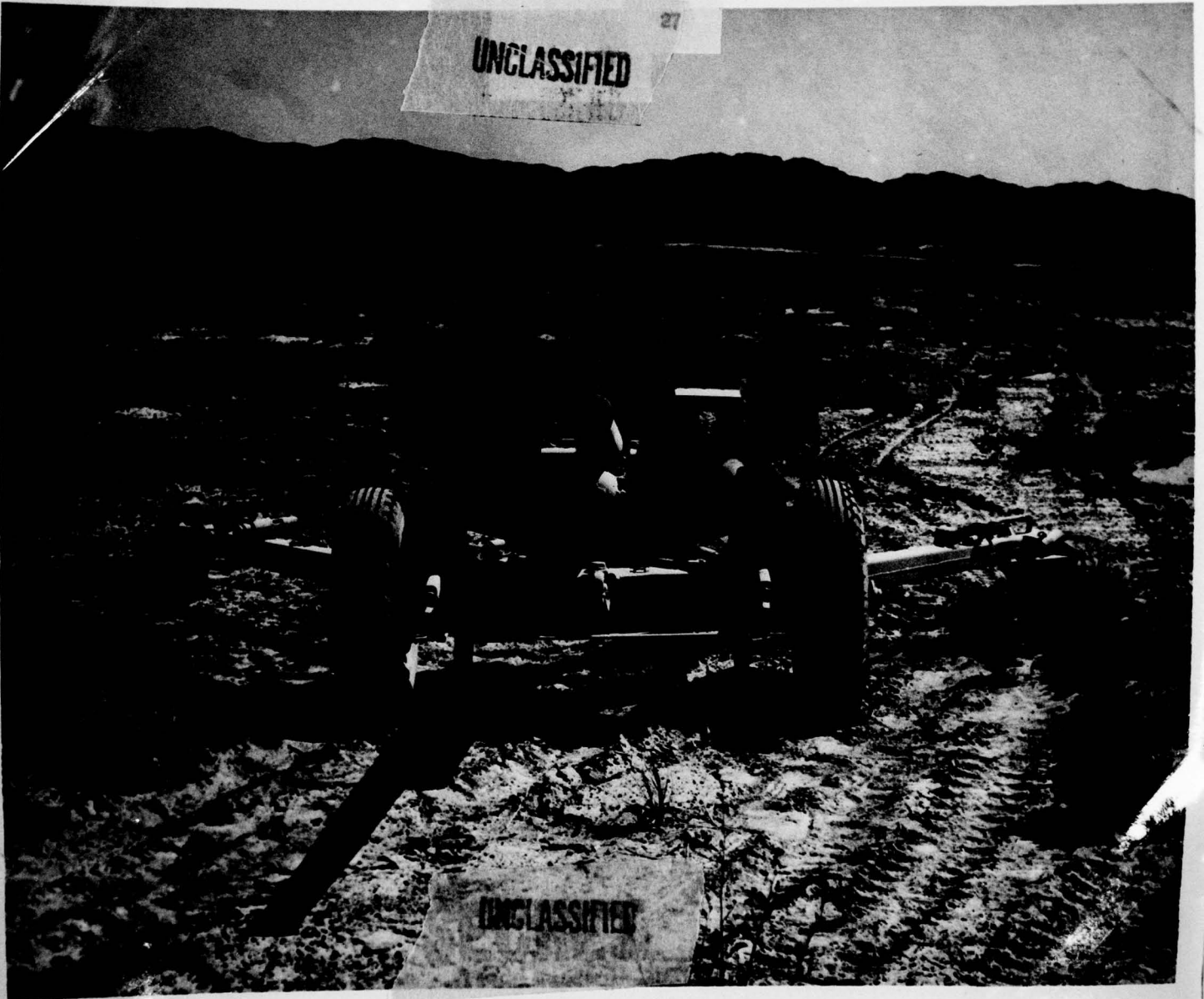
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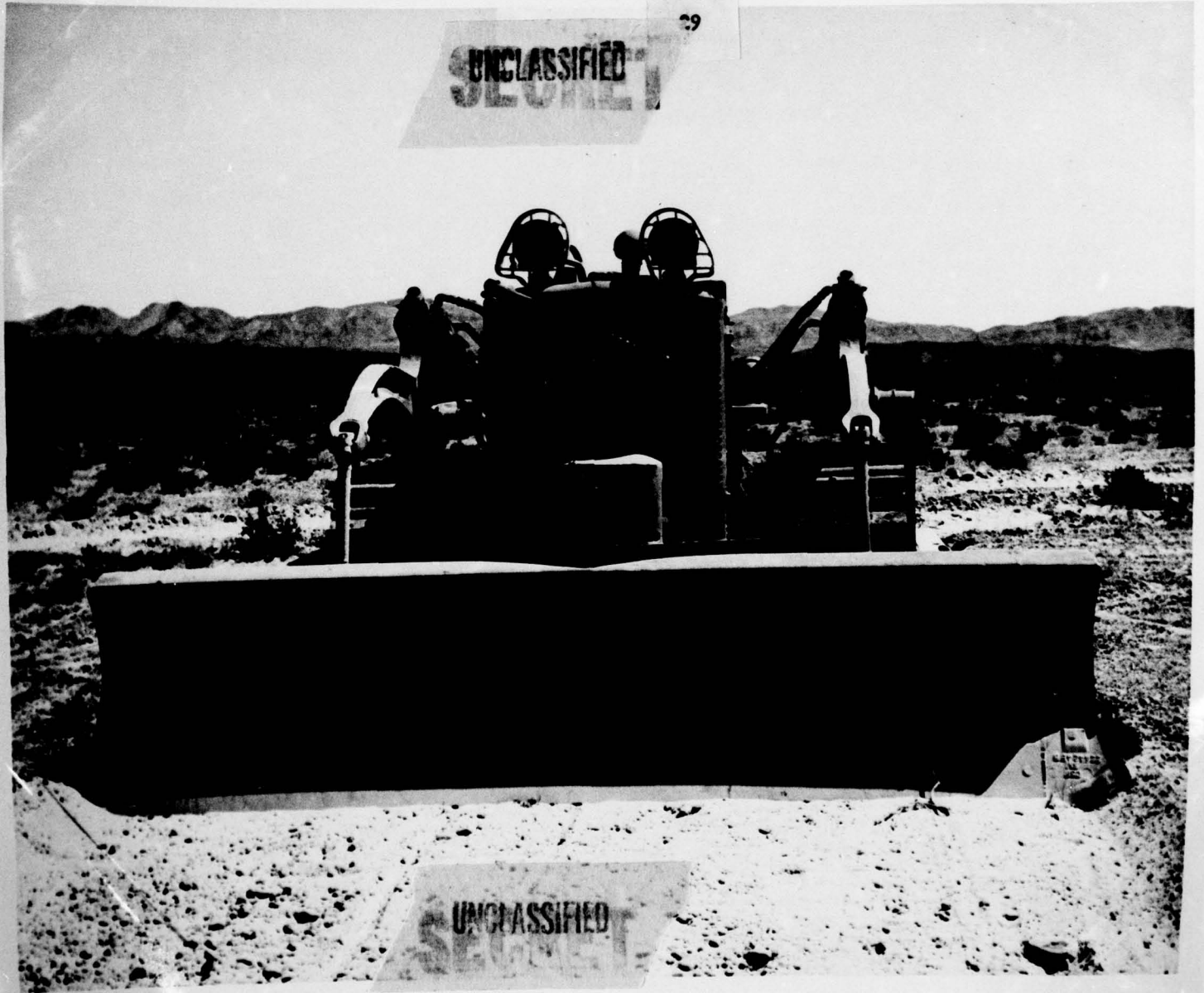


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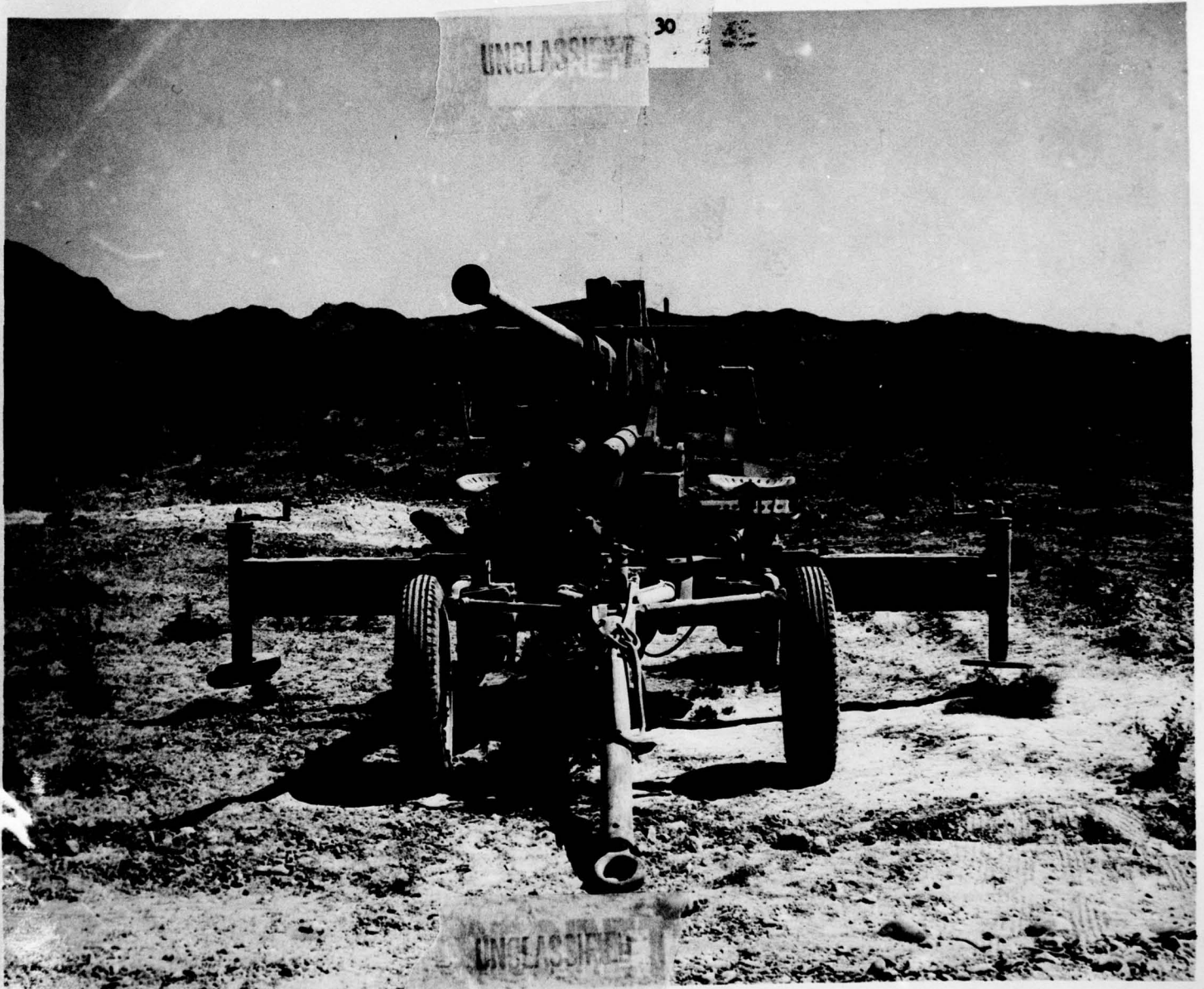


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EXERCISE DESERT ROCK LAS VEGAS NV
EXERCISE DESERT ROCK VII AND VIII. ANNEX L.(U)
1957

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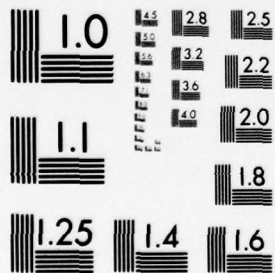
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

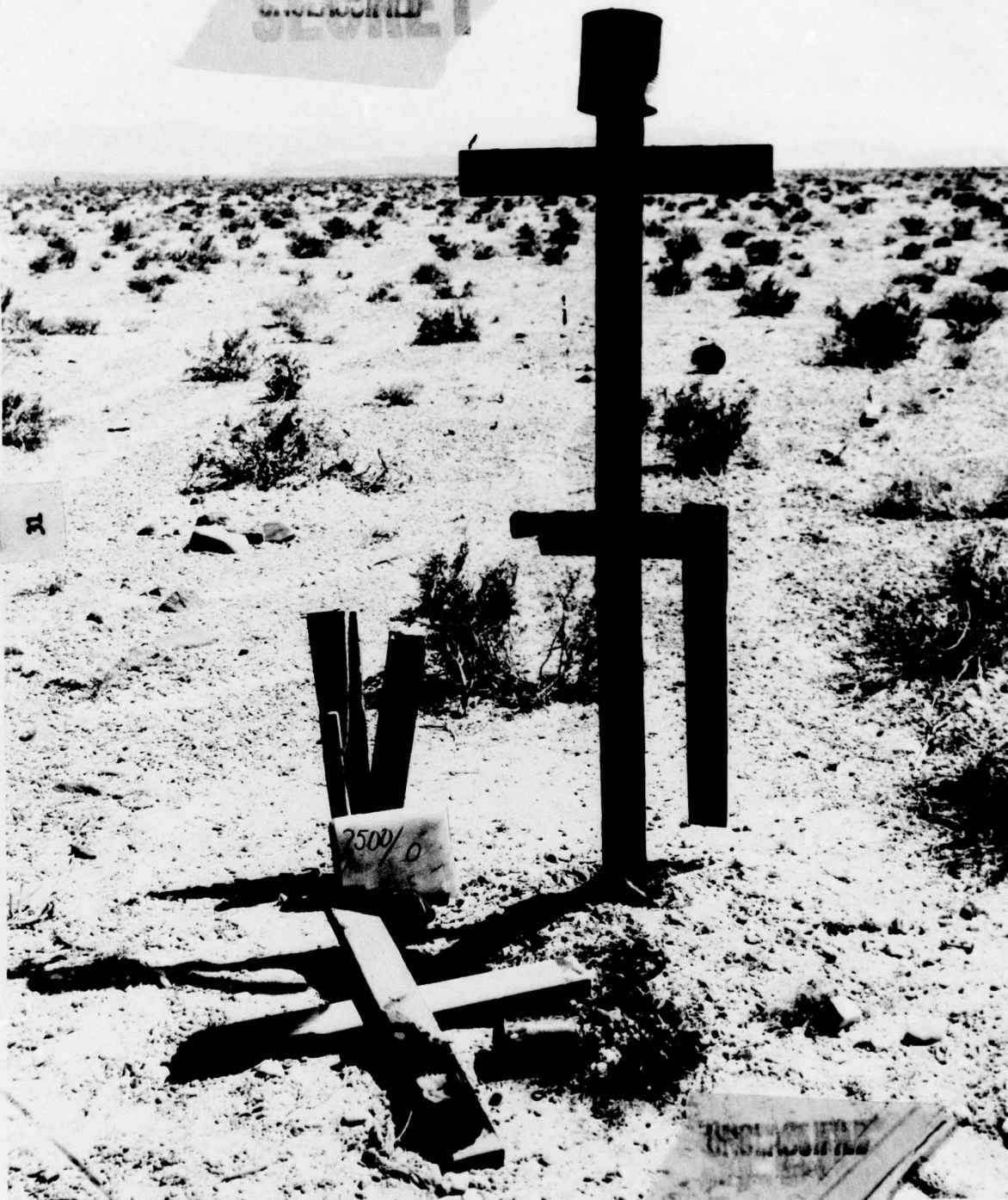
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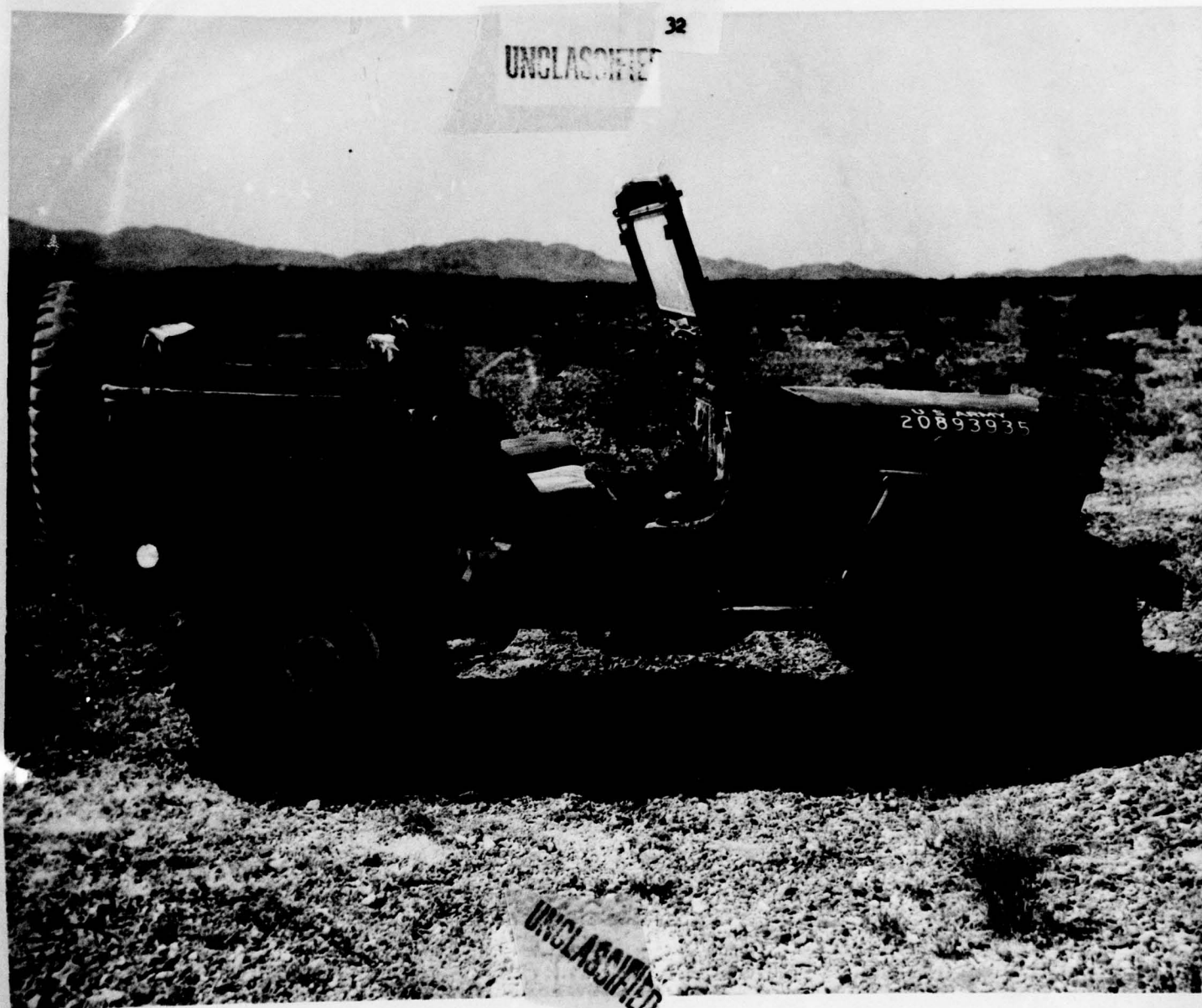
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BEFORE

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AFTER

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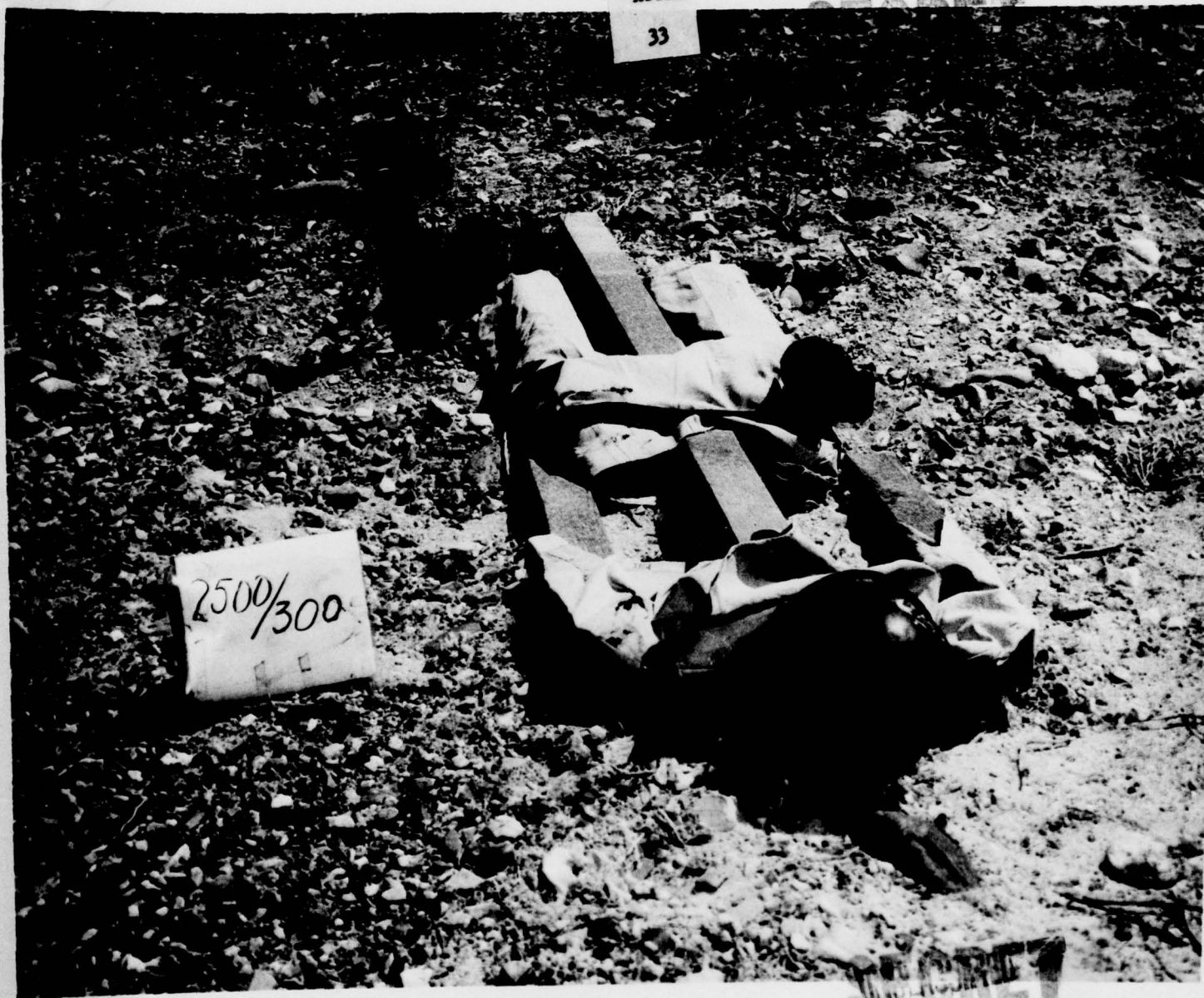
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2500/300

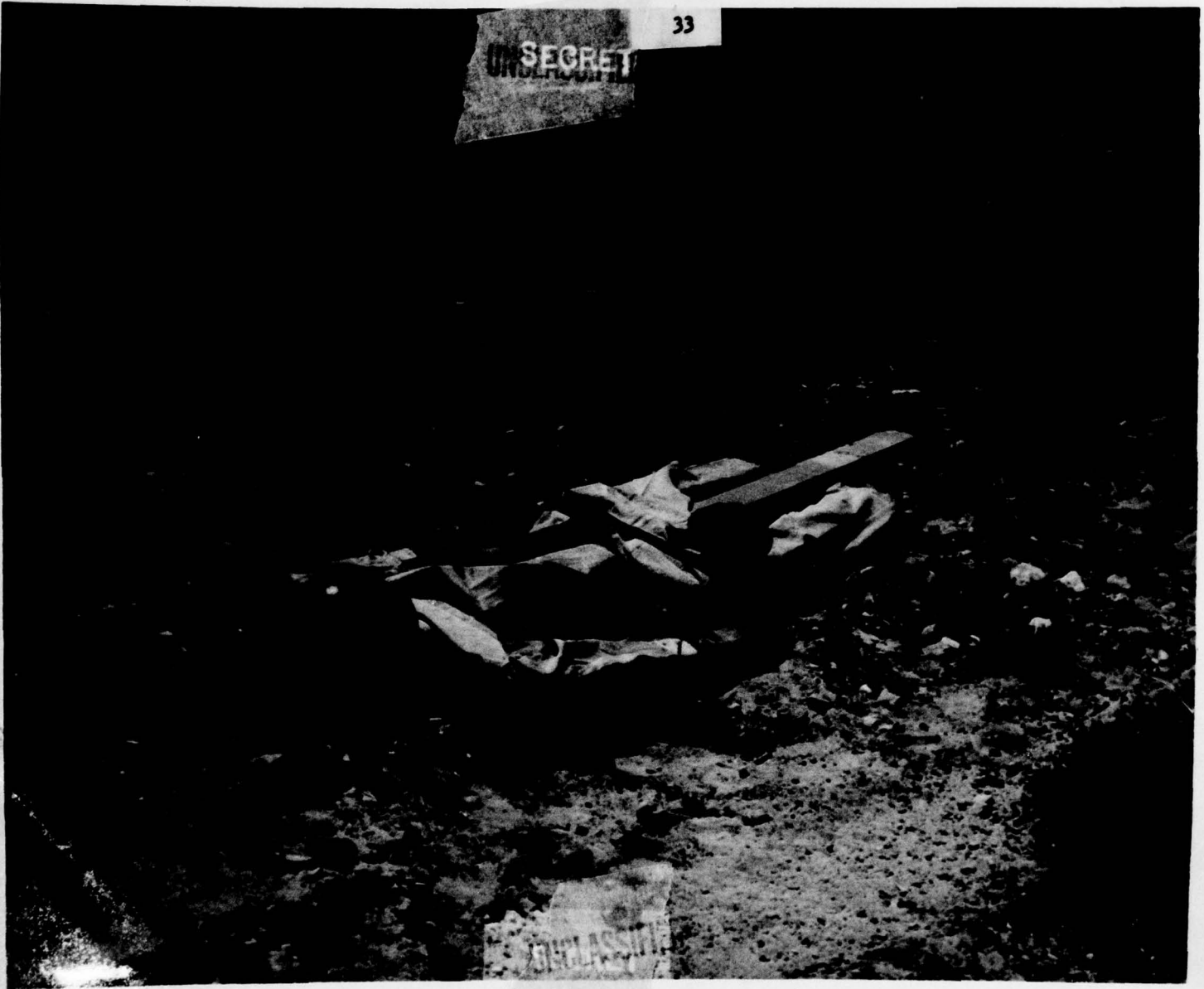


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Technical Considerations
Shot "SMOKY"
(Shot Day - 31 August 1957)

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Design Yield - 45 KT
Actual Yield - 45 KT (Preliminary Report)
Ht of Burst - 700 Feet
Time of Burst - 0530 Hours
Temperature - 14° C
Air Density - 856 mb
Elevation - 5179 Above MSL (Burst Point)
Humidity - 31 Percent

DYNAMIC PRESSURES

60 psi - 500 Yards
40 psi - 570 Yards
20 psi - 695 Yards
15 psi - 745 Yards
10 psi - 835 Yards
5 psi - 1030 Yards
2 psi - 1280 Yards
1 psi - 1550 Yards

THERMAL RADIATION

60 cal/cm² - 1300 Yards
40 cal/cm² - 1645 Yards
30 cal/cm² - 1865 Yards
20 cal/cm² - 2260 Yards
10 cal/cm² - 3090 Yards
5 cal/cm² - 4220 Yards

All computations to arrive at predicted damage was based on scaling laws and damage curves in TM 23-200, Capabilities of Atomic Weapons, exclusively.

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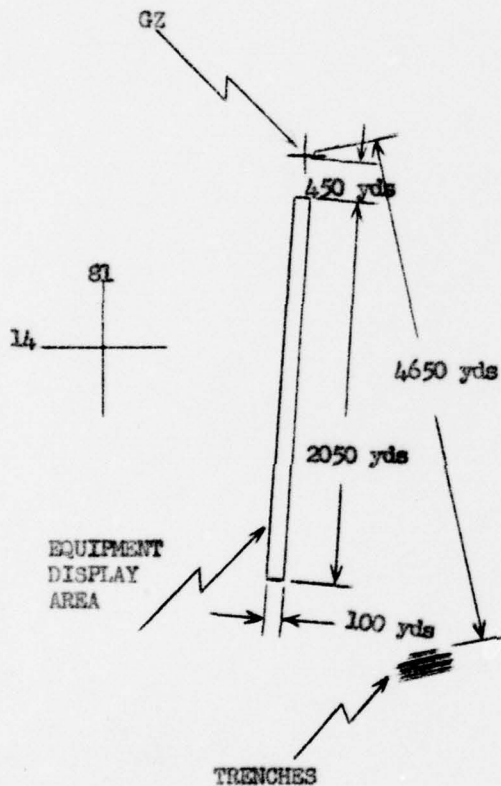
EQUIPMENT DISPLAY AREA

Shot "SMOKY"

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SMOKE

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Map: NEVADA, 1/50000
FRENCHMAN LAKE
Sheet

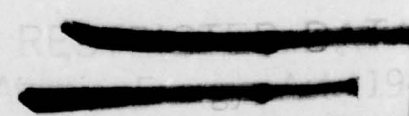


5' Deep
2' wide
50 Yds long (command trench)
725 Yds long (each observer trench)
100' Between trenches



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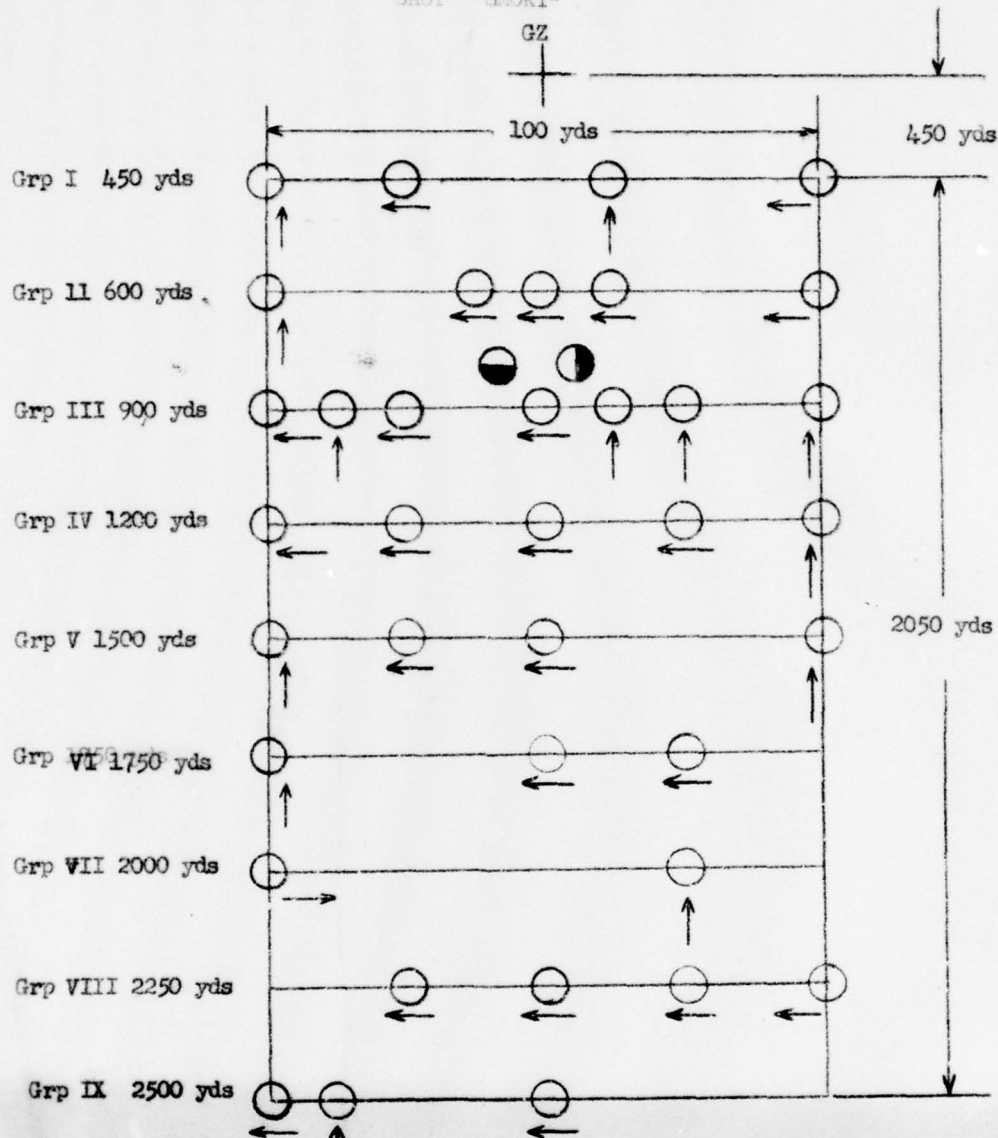
24



EQUIPMENT DISPLAY AREA (ADMINISTRATIVE)

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SHOT "BROOK"



*Includes only selected items of equipment evaluated in this report.

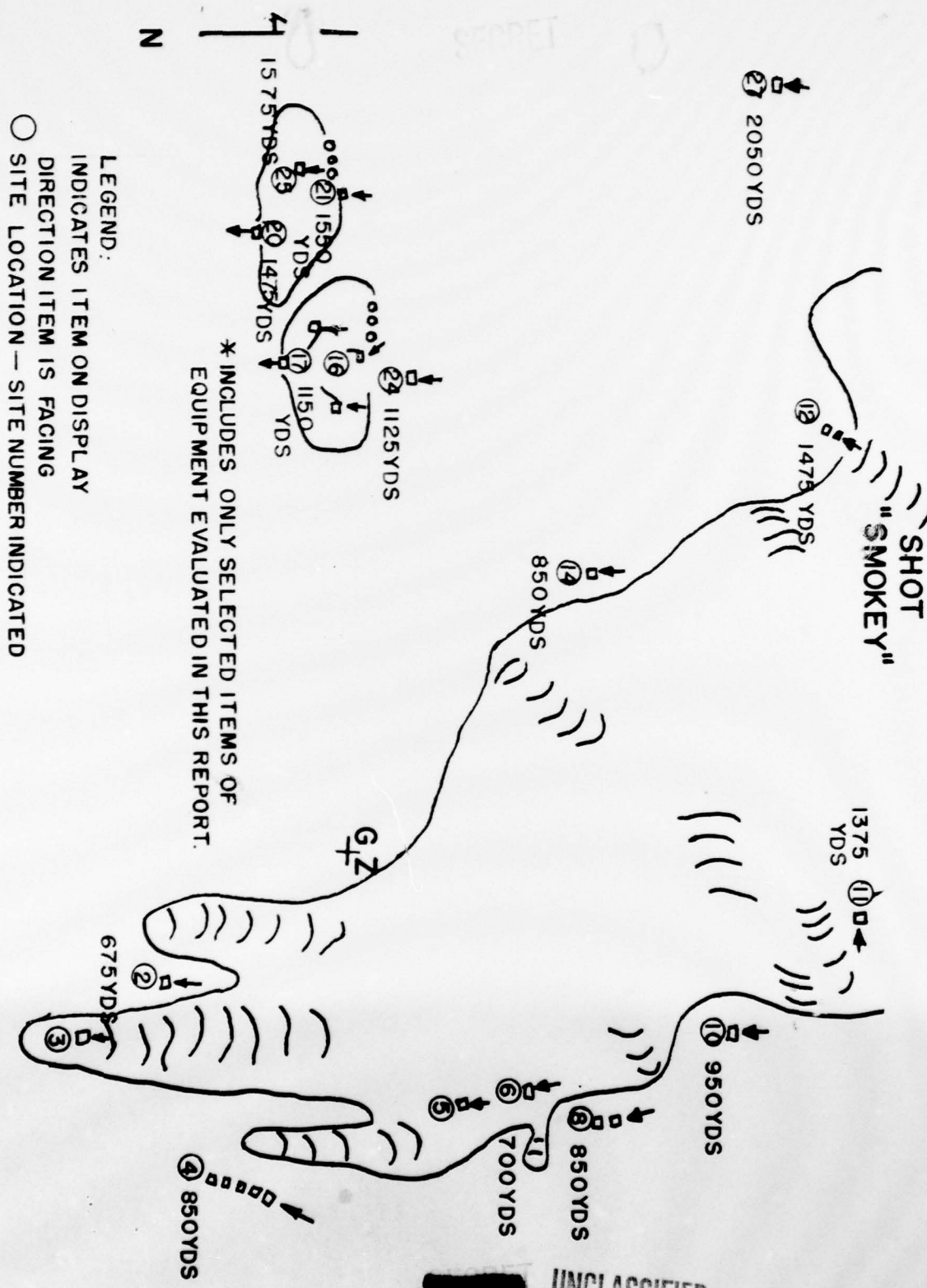
LEGEND:

- Item on display
- ◐ Unrevetted foxhole
- ◑ Revetted Foxhole
- ← Item facing side on 25
- ↑ Item facing head on

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* EQUIPMENT DISPLAY AREA (TACTICAL)



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EQUIPMENT DISPLAY
(Administrative)
Shot "SMOKY"

GRP	ITEM	YARDS FROM GZ	PREDICTED DAMAGE	ACTUAL DAMAGE
I	Tank, M4	450	Severe	Moderate
	Gun, 57 MM	450	Severe	Severe
	Gun, 90 MM	450	Severe	Severe
	Tank, M24	450	Severe	Severe
II	Gun, 40 MM	600	Moderate	Severe
	MG, 50 Cal	600	Moderate	Severe
	Tractor, Engr	600	Severe	Severe
	Searchlight, w/Trl&Gen	600	Severe	Severe
	Sedan	600	Severe	Severe
III	Air Compressor	900	Severe	Severe
	Truck, 2 1/2 Ton	900	Severe	Severe
	Truck, 2 1/2 Ton	900	Severe	Severe
	Trailer, Water	900	Severe	Severe
	Steam, Cleaner	900	Severe	Severe
	Truck, 1/2 Ton	900	Severe	Severe
	Tank, M4	900	Light	Light
	Foxhole, unrevetted w/	885	Collapse/Destroy	Light/Destroy
	Mannequin Standing			
	Foxhole, revetted w/	885	No Damage	Light/No Damage
	Mannequin Sitting			
IV	Tank, M24	1200	Light	Light
	Truck, 1 1/2 Ton	1200	Moderate	Severe
	55 Gal Drum (10)	1200	Light	Light
	MG 30 Cal	1200	Light	Light
	Water Softener w/	1200	Moderate	Moderate
	Tank			
V	Mannequin (Prone)	1500	Singed	Singed
	Generator, (Small)	1500	Light	Moderate
	Sedan	1500	Moderate	Severe
	Mannequin, (Standing)	1500	Destroyed	Destroyed
VI	Truck, 1 1/2 Ton	1750	Light	Light
	MG, 50 Cal	1750	Light	Light
	Truck, 1/2 Ton	1750	Light	Light
VII	Sedan	2000	Light	Light
	Truck, 1 1/2 Ton	2000	Light	Light
VIII	Truck, 2 1/2 Ton	2250	Light	Light
	Cans, 5 Gal full	2250	Light	None
	Generator, (Large)	2250	Light	Light
	Truck, 1/2 Ton	2250	Light	Light
IX	Sedan	2500	Light	Light
	Panel, Cloth	2500	Destroyed	Destroyed
	Tent, Sqd w/QM & Sig BQ.	2500	Severe	Severe

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EQUIPMENT DISPLAY (Tactical)
Shot "Smoky"

UW 1000 1000

<u>SITE</u>	<u>ITEM</u>	<u>YARDS FROM GZ</u>	<u>PREDICTED DAMAGE</u>	<u>ACTUAL DAMAGE</u>
2.	Tank, M4	575	Moderate	Light
3.	Gun, 57 MM (AT)	825	Light	Light
4.	Gun, 57MM (AT)	850	Light	Light
	Searchlight w/Trl	850	Moderate	Severe
	Truck, 1/2 Ton	850	Light	Severe
	Generator, Trl Mntd	850	Light	Light
	Truck, 3/4 Ton	850	Light	Severe
5.	Tank, M4	650	Moderate	Light
6.	Howitzer, 75MM Pack	700	Moderate	Moderate
8.	Truck, 1/2 Ton	850	Moderate	Moderate
	Truck, 1 1/2 Ton	850	Moderate	Moderate
10.	Sedan	950	Moderate	Severe
11.	Carrier, M29C	1375	Light	Light
12.	Truck, 1/2 Ton w/Radio	1475	None	Light
	Truck, 1 1/2 Ton	1475	None	Light
14.	LVT, Marine	850	Light	Moderate
16.	Gun, 57MM (AT)	1150	Light	None
17.	M4, 30 Cal	1150	Light	Light
	Comm Equip	1150	Light	Moderate
	Radio and Telephone			
	Recoil Rifle 106 MM w/mannequin	1150	Light/Destroy	Light/Destroy
20.	BAR	1475	None	None
21.	Gun, 57MM (AT)	1550	None	None
22.	Truck, 1/2 Ton	1850	None	Light
24.	Tank, M4 w/Mannequin	1125	Light/Destroy	None/Destroy
25.	Tank, M48 w/Mannequin	1575	None/Destroyed	Light/Destroyed
27.	Mortar, 81MM	2050	None	None

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REPRODUCTION
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"SMOKY"

and

Equipment Display Area

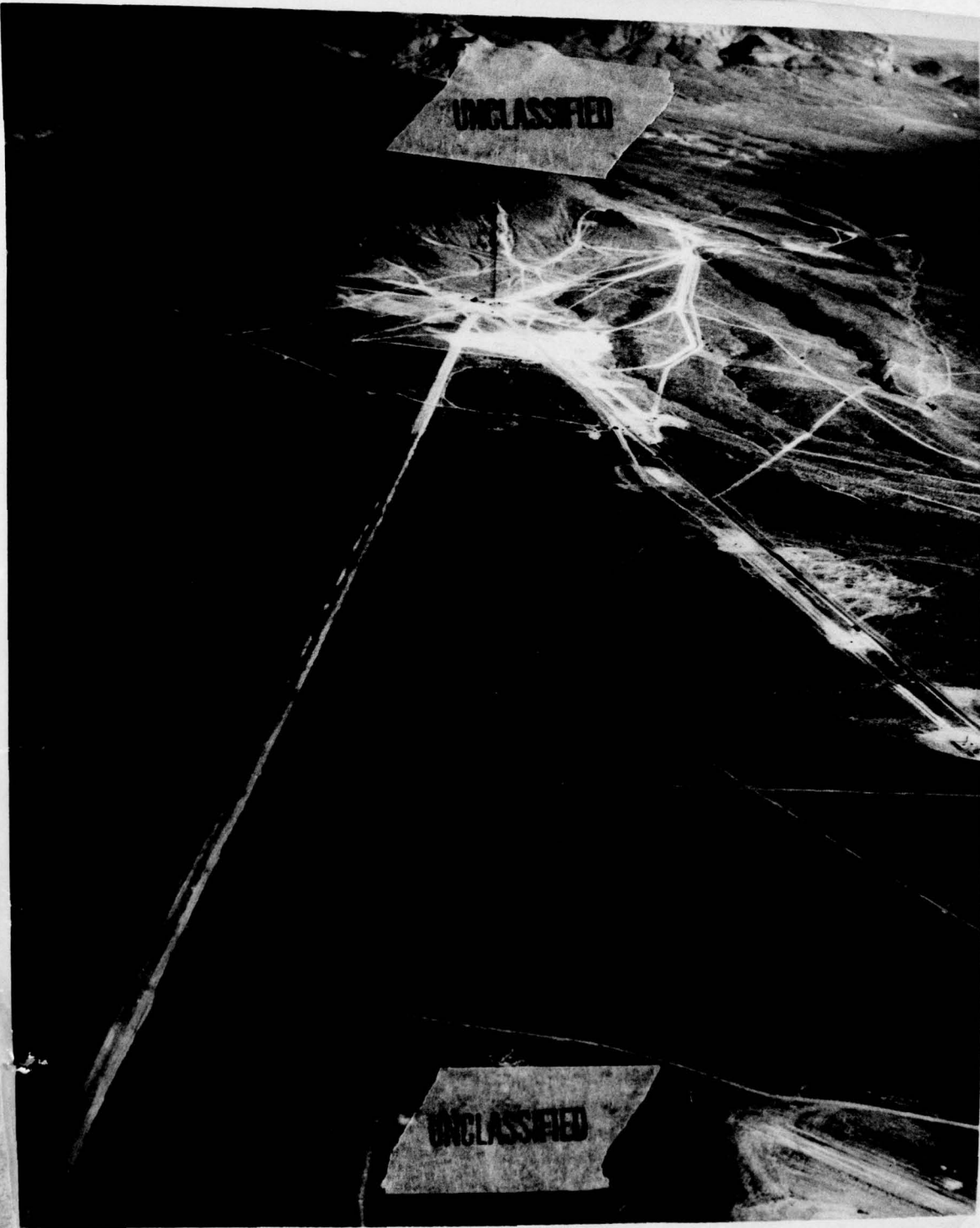
(Line of Vehicles near GZ is not part of display.
They are buses which transported Observers to the
display area.)

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DAMAGE COMPARISON

Predicted vs Actual

Shot "SHOCK"


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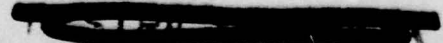
DEFINITION
OF
DAMAGE

- LIGHT - Damage which does not interfere with immediate military operations, but necessitates some repair to restore the items to complete military usefulness.
- MODERATE - Damage which is sufficient to prevent any military use until some repairs are effected.
- SEVERE - Damage whenever repair is essentially impossible without removal to a major repair facility,

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EXERCISE DESERT BOOK VII and VIII

RESTRICTED DATA

1946

SHOT: Snaky

ANTICIPATED YIELD: 45 KT

ACTUAL YIELD: 45 KT

PHOTO REF. NR.	ITEM	DISTANCE From GZ (Yards)	ORIENTATION & PROTECTION	DAMAGE CLASSIFICATION		DESCRIPTION OF ACTUAL DAMAGES
				PREDICTED	ACTUAL	
1	Tank, M-4	450	Head on, surface	Severe	Moderate	Tube blown off turret; tank displaced about 40 feet; tank appeared intact otherwise.
2	Gun, 57mm	450	Side on, surface	Severe	Severe	Wheels and operating handles blown off; one spade bent out of position; displaced 45 yards.
3	Gun, 90mm	450	Head on, surface	Severe	Severe	Destroyed; one wheel missing - remaining torn apart; outrigger leg blown off and the other distorted; displaced 100 yards; tube and part of mechanism displaced 50 yards further away from carriage.
4	Tank, M-24	450	Side on, surface	Severe	Severe	Track blown off and found in 4 parts within a 50 yard radius; tank overturned; bogie wheel bent out of line; drive sprocket bent out of line; tank turret blown off and displaced 100 yards from tank; gun tube torn loose from turret and laying 20 yards away; tank displaced 15 yards.
5	Machine gun, cal 50	600	Side on, surface	Severe	Severe	Torn apart; cradle found 100 yards away in original position.

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PHOTO REF. NR.	ITEM	DISTANCE From GZ (Yards)	ORIENTATION & PROTECTION	DAMAGE CLASSIFICATION		DESCRIPTION OF ACTUAL DAMAGES
				PREDICTED	ACTUAL	
6	Tractor, Engineer full track	600	Side on, surface	Severe	Severe	Tractor tipped upside down; blade torn off; hydraulic system torn apart; track broken in pieces; tractor displaced 10 yards.
7	Gun, 40mm	600	Head on, surface	Moderate	Severe	Torn apart and scattered; wheels ripped off main carriage; barrel not located; portions of gun displaced 90 yards
8	Search Light w/trailer and generator	600	Side on, surface	Severe	Severe	Torn completely apart; scattered over a 50 yard radius; generator engine and armature laying 40 yards from initial point; trailer less wheels found 100 yards from initial point completely destroyed.
9	Sedan, 5 pass- enger	600	Side on, surface	Severe	Severe	Completely blown apart and scattered throughout the area.
10	Air com- pressor, portable	900	Side on, surface	Severe	Severe	Only tank located; controls completely torn off or extensively damaged; displaced 100 yards.
11	Truck, 2 1/2 ton Commer- cial	900	Head on, surface	Severe	Severe	Cab crushed in as if an object had hit it as well as by blast; paint blistered; carburetor, air cleaner, hose, wiring and distributor melted; displaced 80 yards.

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PHOTO REF. NR.	ITEM	DISTANCE From GZ (Yards)	ORIENTATION & PROTECTION	DAMAGE CLASSIFICATION		DESCRIPTION OF ACTUAL DAMAGES
				PREDICTED	ACTUAL	
17	Foxhole, revetted, w/manne- quin sitting	885	Head on	None	Light- None	Sand bags burned on top and blackened up to 3 feet deep inside; a little dirt fell in from burned sand bags on side away from GZ; mannequin in good condition.
18	Foxhole, unrevetted w/manne- quin standing	885	Head on	Collapsed/ destroyed	Light/ destroyed	Parapet dirt on GZ side blown into foxhole; mannequin burned from thermal and tattered from blast; no helmet left, only the tin can with many dents on GZ side - apparently from gravel being thrown; 2x4 scorched on GZ side.
19	Truck, M-24	1200	Side on, surface	Light	Light	Paint scorched on GZ side.
20	Truck, 2 1/2 ton, Commer- cial	1200	Side on, surface	Moderate	Severe	Some decking off bed of truck; stakes missing; cab crushed in in places; windows blown out; hood missing; badly scorched on GZ side; displaced 35 yards; muffler and exhaust blown off; frame distorted.
21	Drums, 55 gal (10) filled	1200	Upright, surface	Light	Light	Nine drums scattered within a 15 yard radius; one located 100 yards from original position; dents in all drums - no leakage.

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PHOTO REF. NR.	ITEM	DISTANCE From GZ (Yards)	ORIENTATION & PROTECTION	DAMAGE CLASSIFICATION		DESCRIPTION OF ACTUAL DAMAGES
				PREDICTED	ACTUAL	
22	Machine gun, cal 30	1200	Side on, surface	Light	Light	Tripod displaced 20 yards and disconnected from gun; barrel and mechanism appeared in good condition except for a little scorching.
23	Tanks, water softener	1200	Upright, surface	Moderate	Moderate	Tanks scattered and dented; pipe connections broken off.
24	Mannequin	1500	Head on, face down, surface	Singed	Singed	Helmet blown 2 yards away; left shoulder of shirt burned; right shoulder of shirt scorched and shredded; canteen cover ripped a little from blast also scorched; web belt blackened; left hip of trousers slightly burned and appeared ripped a little from blast effects.
25	Generator, skid mounted	1500	Side on, surface	Light	Moderate	Displaced 5 yards; paint scorched on GZ side; side panels dented on GZ side; panel board loose; engine breather hose off; wiring for distributor burned and laying along side of unit.

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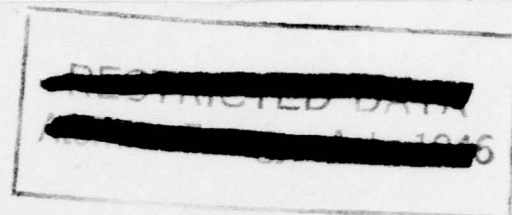


PHOTO REF. NR.	ITEM	DISTANCE From GZ (Yards)	ORIENTATION & PROTECTION	DAMAGE CLASSIFICATION		DESCRIPTION OF ACTUAL DAMAGES
				PREDICTED	ACTUAL	
26	Sedan, 5 passenger	1500	Side on, surface	Moderate	Severe	Vehicle tipped upside down; displaced 5 yards; all windows blown out; top crushed in; hood crushed in; paint blistered.
27	Mannequin	1500	Upright, head on, surface	Destroyed	Destroyed	Fatigues tattered and blown apart; 2x4 scorched; face piece to gas mask showed signs of heat but was not burned; displaced up to 50 yards in all directions away from blast; helmet blackened on front side; web belt blackened and shredded from blast; first aid pouch shredded.
28	Truck, 1 1/2 ton Commercial	1750	Head on, surface	Light	Light	Paint blistered; seat blown out; cab crushed slightly; stakes blown off; truck displaced 3 yards; windshield and right door window blown out; exhaust pipe hanging down.
29	Machine gun, cal 50	1750	Side on, surface	Light	Light	Tipped over sideways; a little blistering of exterior.
30	Truck, 1/4 ton	1750	Side on, surface	Light	Light	Tipped over sideways; blackened; wind- shield blown off with frame about 75 yards away.

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PHOTO REF. NR.	ITEM	DISTANCE From GZ (Yards)	ORIENTATION & PROTECTION	DAMAGE CLASSIFICATION		DESCRIPTION OF ACTUAL DAMAGES
				PREDICTED	ACTUAL	
31	Truck, 1 1/2 ton, commercial	2000	Head on, surface	Light	Light	Dented top and door on GZ side; hood blown open.
32	Sedan, 5 passenger	2000	Side on	Light	Light	Rear glass shattered; top dented; paint on GZ side blistered; back end displaced 1 yard.
33	Truck, 2 1/2 ton, commercial	2250	Side on, surface	Light	Light	Paint scorched, GZ door blown open and glass shattered; stakes on GZ side bent inward; hood blown off.
34	Cans, gas, 5 gal	2250	Edge on, surface	Light	None	Cans tipped over.
35	Generator, large, skid mounted	2250	Side on, surface	Light	Light	Door on GZ side dented; paint scorched.
36	Truck, 1/4 ton	2250	Side on, surface	Light	Light	Hood blown open; paint scorched; seats scorched and one corner burned.

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PHOTO REF. NR.	ITEM	DISTANCE From GZ (Yards)	ORIENTATION & PROTECTION	DAMAGE CLASSIFICATION		DESCRIPTION OF ACTUAL DAMAGES
				PREDICTED	ACTUAL	
37	Sedan, 5 pass- enger	2500	Head on, surface	Light	Light	Windshield shattered; paint blistered; top dented.
38	Panel, cloth	2500	Head on, surface	Destroyed	Destroyed	Shredded; scorched; frame broken; about 1/2 of cloth left.
39	Tent, squad, G4, and signal equip.	2500	Side on, Surface	Severe	Severe	Tent blown 100 feet from stakes; evidence of burning and shredding; cots spot burned and blown 50 feet; duplicating machine burned and melted; gas cans slightly scorched; commo equip scorched; canvas covers scorched; (Little fires within tent area was sufficient in most cases to severely damage all equipment except bales, cans and drums.)
40	Tank, M-4	575	Side on, partial defilade	Moderate	Light	Top hatch blown off; displaced slightly; paint burned.
41	Gun, 57mm (AT)	825	Side on, surface	Light	Light	One shield blown off; paint blistered; turned around.

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~~RESTRICTED DATA~~
~~ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED~~

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PHOTO REF. NR.	ITEM	DISTANCE From GZ (Yards)	ORIENTATION & PROTECTION	DAMAGE CLASSIFICATION		DESCRIPTION OF ACTUAL DAMAGES
				PREDICTED	ACTUAL	
42	Truck, 3/4 ton	850	Side on, surface	Light	Severe	Blown 25 yards; frame and body bent and twisted; paint blistered.
43	Generator, trailer mounted	850	Side on, surface	Light	Light	Tipped over; paint blistered.
44	Truck, 1 ton	850	Side on, partial defilade	Light	Severe	Demolished.
45	Search- light, trailer mounted	850	Side on, partial defilade	Moderate	Severe	Tripped off trailer; light twisted and torn apart; trailer suffered light damage.
46	Gun, 57mm (AT)	850	Side on, partial defilade	Light	Light	Turned around in place; paint blistered; one half of shield blown off.
47	Tank, M-4	650	Side on, surface	Moderate	Light	Paint blistered; fenders dented; displaced 25 feet.
48	Howitzer, 75mm, pack	700	Side on, surface	Moderate	Moderate	Paint blistered; tipped over; carriage out of alignment.

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Atomic Energy Act 1946

[REDACTED]

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PHOTO REF. NR.	ITEM	DISTANCE From GZ (Yards)	ORIENTATION & PROTECTION	DAMAGE CLASSIFICATION		DESCRIPTION OF ACTUAL DAMAGES
				PREDICTED	ACTUAL	
49	Truck, 1 1/4 ton	850	Side on.	Moderate	Moderate	Glass shattered; hood blown open; paint scorched and blistered; top frame bent and burned.
50	Truck, 1 1/2 Ton	850	Side on	Moderate	Severe	Displaced 25 yds and turned around; glass shattered; hood and bed stakes blown off.
51	Sedan, 5 passenger 990		Side on	Moderate	Severe	Frame and body twisted and tangled; displaced 25 yards, hood twisted and mangled.
52	Carrier M 290	1375	Side on	Light	Light	Paint scorched on GZ side, displaced about 2 feet, few dents in frame.
53	Trucks 1/2 ton w/radio	1475	Side on.	None	Light	Windshield shattered; hood blown open; radio dislodged but still on mount.
54	Truck, 1 1/2 ton Commercial	1475	Side on.	None	Light	Glass shattered; hood blown off; door and bed bent.
55	LVT, Marine	890	Side on.	Light	Moderate	Truck blown off; rolled 90 yards; hatches and doors blown off.

[REDACTED]

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[REDACTED] NOTED DATA

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PHOTO REF. NR.	ITEM	DISTANCE From GZ (Yards)	ORIENTATION & PROTECTION	DAMAGE CLASSIFICATION		DESCRIPTION OF ACTUAL DAMAGES
				PREDICTED	ACTUAL	
56	Gun, 57 mm (AT)	1150	Side on, dug in tactically	Light	None	Paint scorched; trails half buried with dirt,
57	Machine Gun, 30 Cal	1150	Side on, dug in tactically	Light	Light	Paint blistered; rear sight bent; tripod blown 50 feet, gun blown 10 feet,
58	Commo Equip	1150	Side-on	Light	Moderate	Radios: Microphone shattered; dial broken; radio blown into hole. Tele- phones no visible damage; blown into hole,
59	106 mm Recoilless Rifle w/ Mannequin	1150	Side on, dug in tactically	Light/ destroyed	Light/ destroyed	Muzzle moved to the right; paint scorched; mannequin disintegrated; bits of cloth noticed 10 to 50 yards from original position,
60	B.A.R.	1475	Side on, dug in tactically	None	None	Displaced 3 feet.
61	Gun, 57mm (AT)	1550	Side on, dug in tactically	None	None	Paint scorched,
62	Truck, 1/2 ton	1850	Side on, partial defilade	None	Light	Paint scorched; seat scorched; Hood blown open and bent,

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PHOTO REF. NR.	ITEM	DISTANCE From GZ (Yards)	ORIENTATION & PROTECTION	DAMAGE CLASSIFICATION		DESCRIPTION OF ACTUAL DAMAGES
				PREDICTED	ACTUAL	
63	Tank M4, w/mannequin, standing in driver's hatch	1125	Side on, hull defilade	Light/ destroyed	Light/ destroyed	Paint on tank scorched; mannequin blown out of hatch and scattered.
64	Tank M48, w/mannequin standing in turret	1575	Side on, hull defilade	None/ destroyed	Light/ destroyed	Paint on tank scorched; mannequin destroyed by burning and scattered.
65	Mortar, 81 mm	2090	Dug in	None	None	None

43

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EXTRACTED DATA
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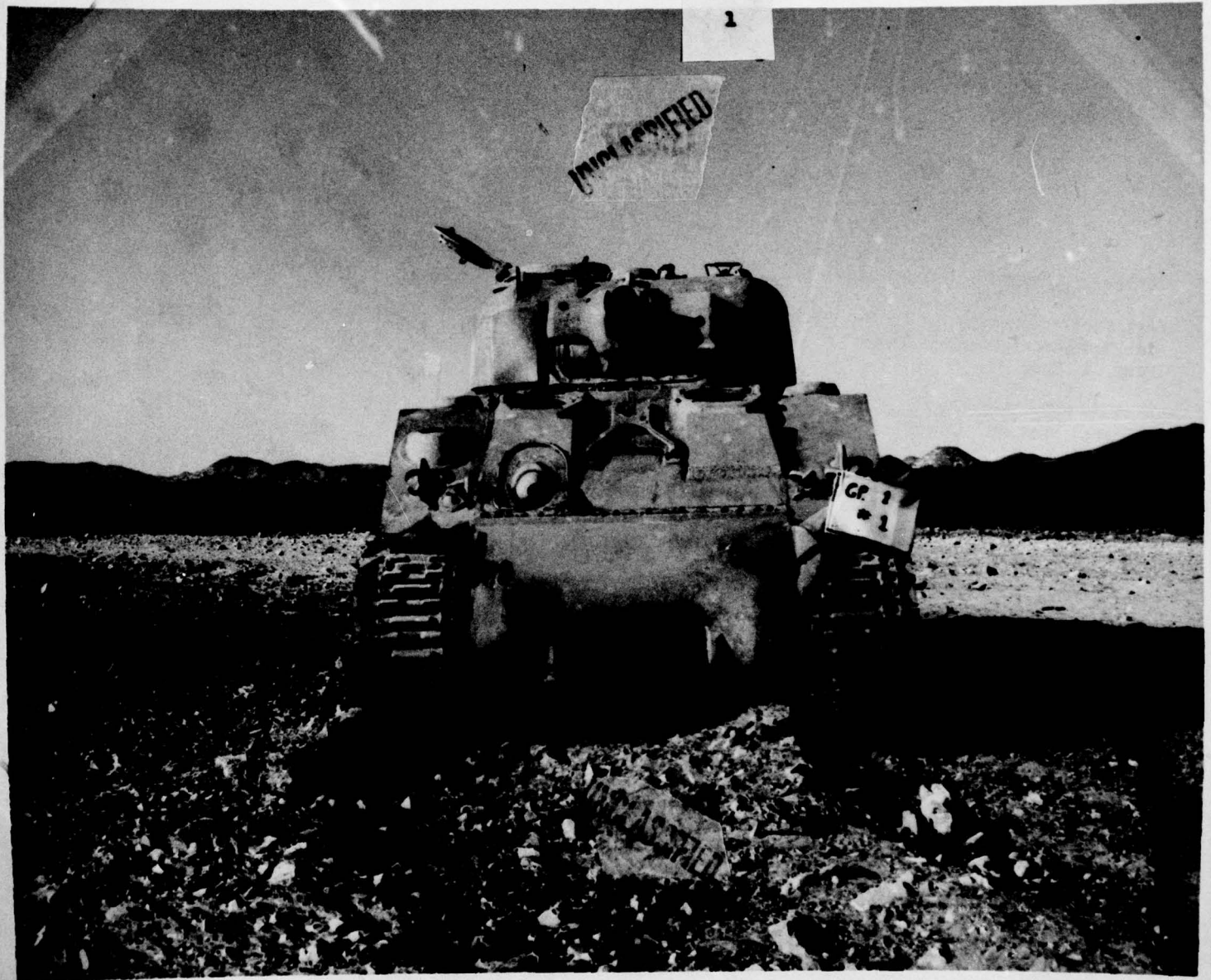


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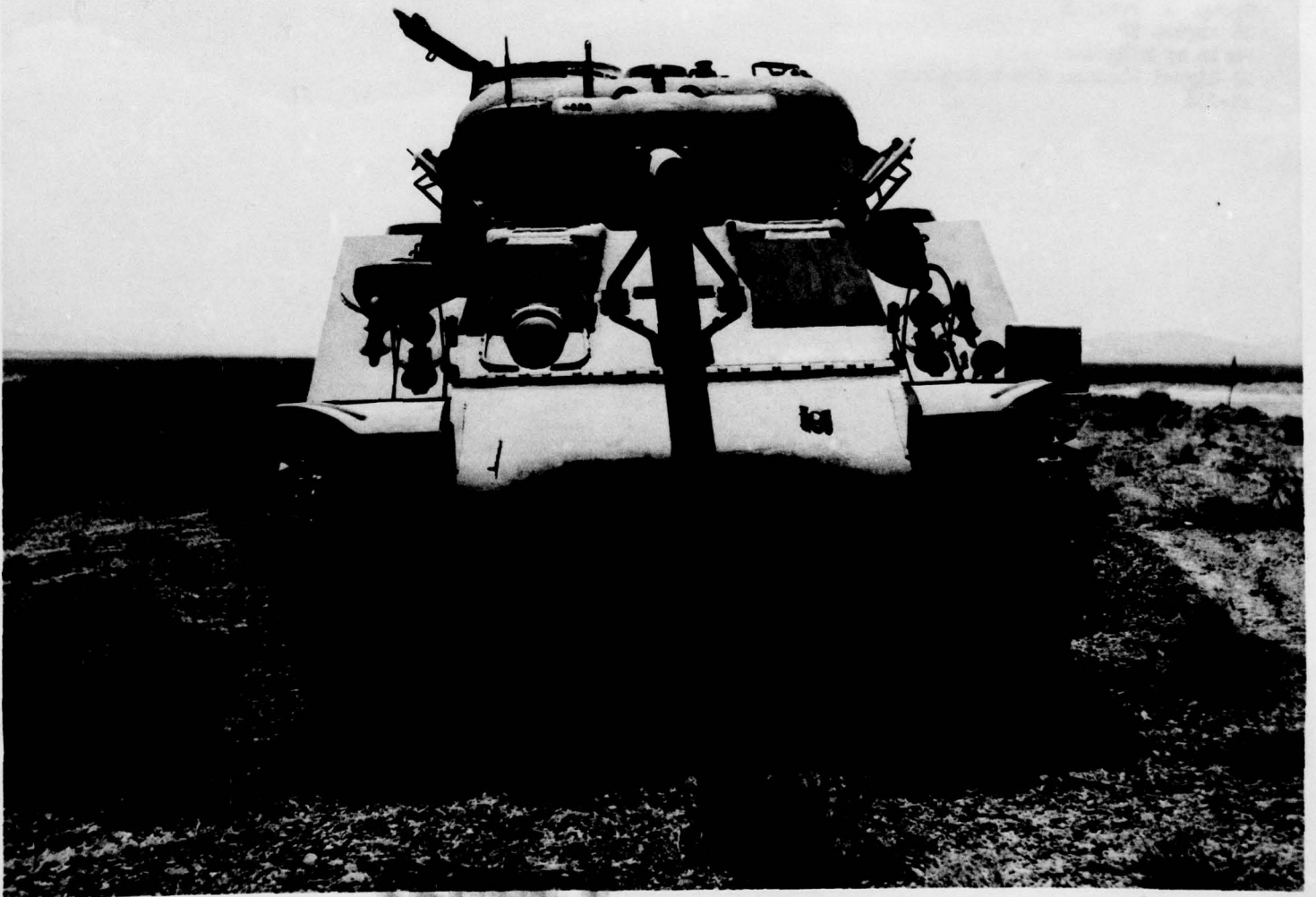
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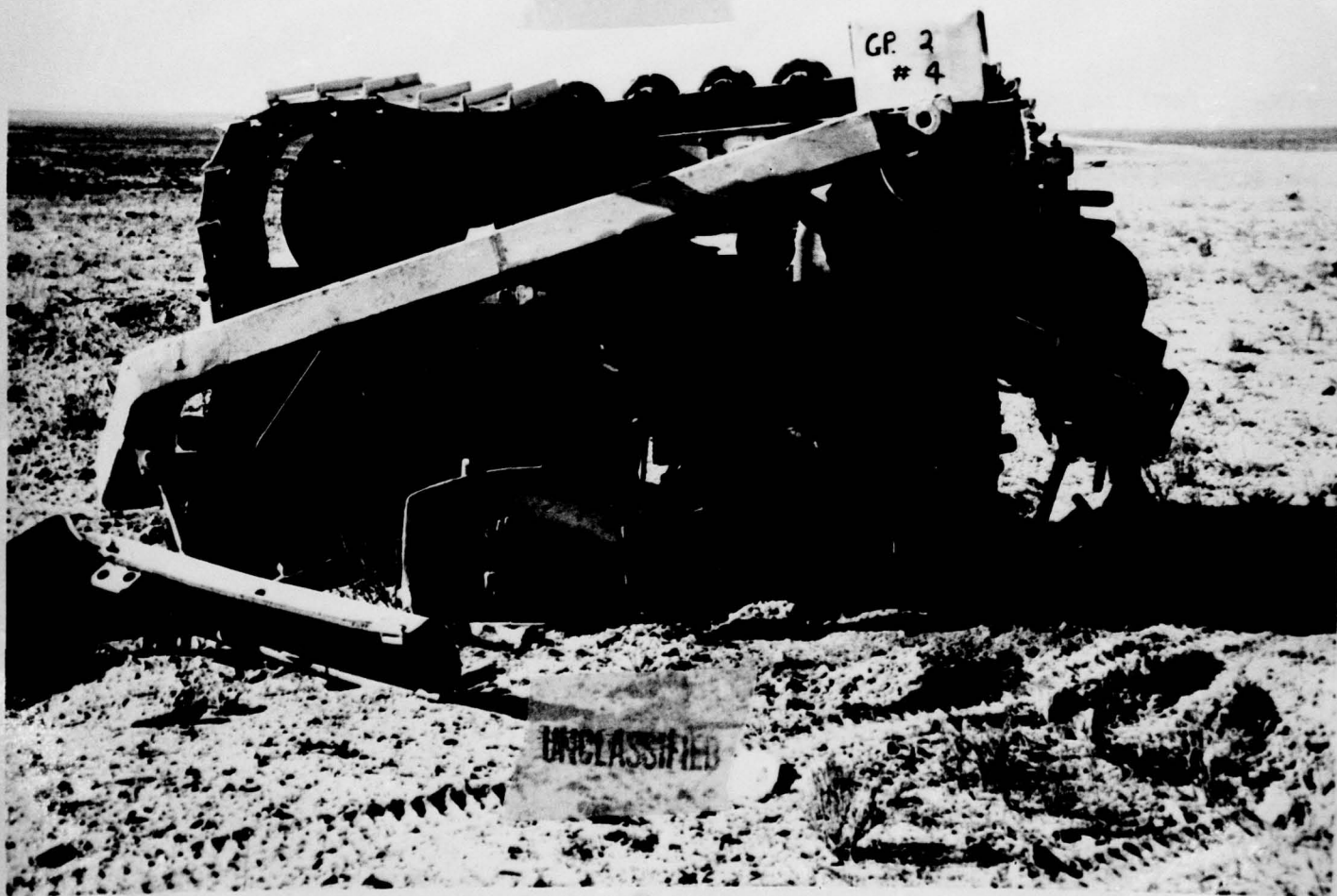
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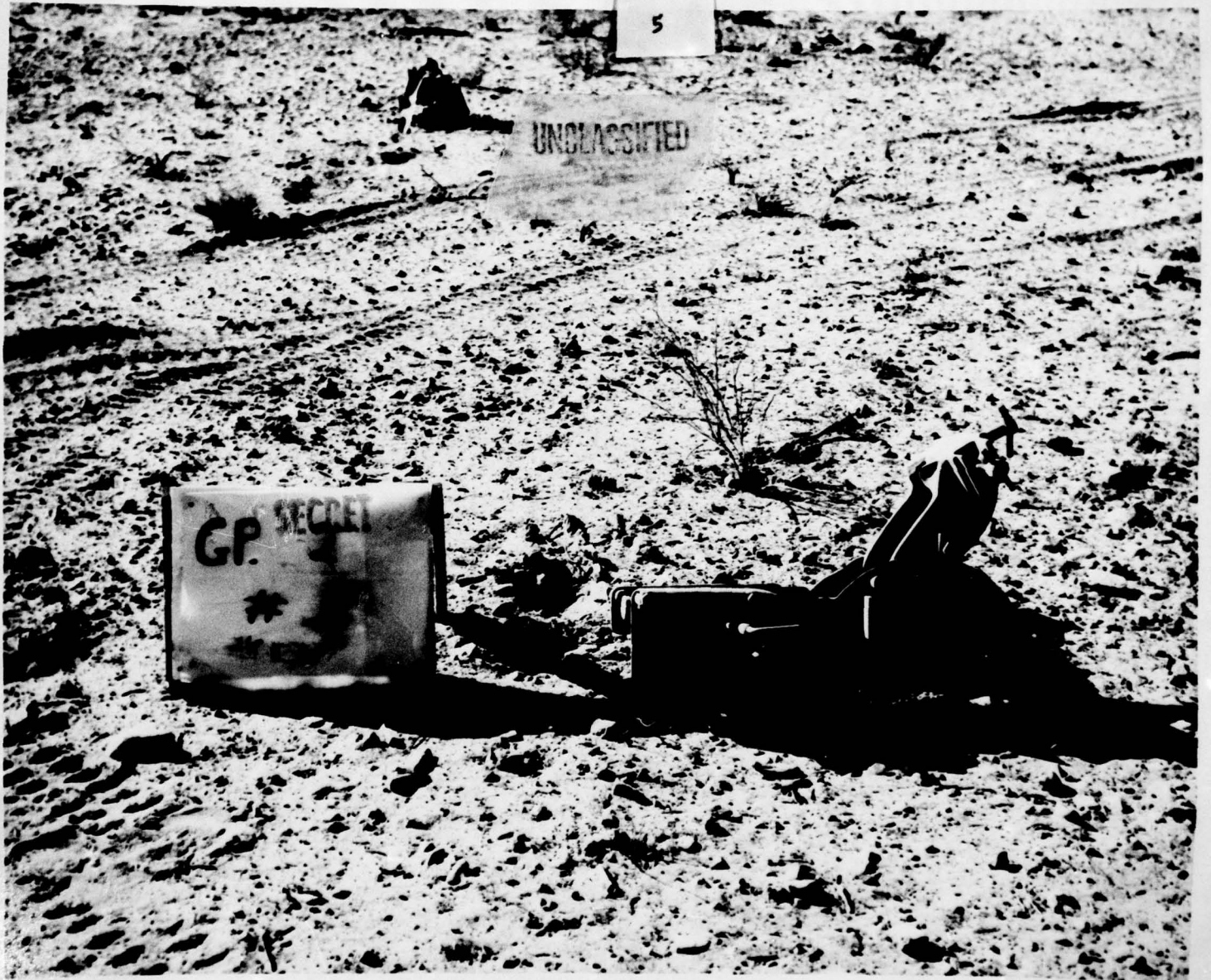


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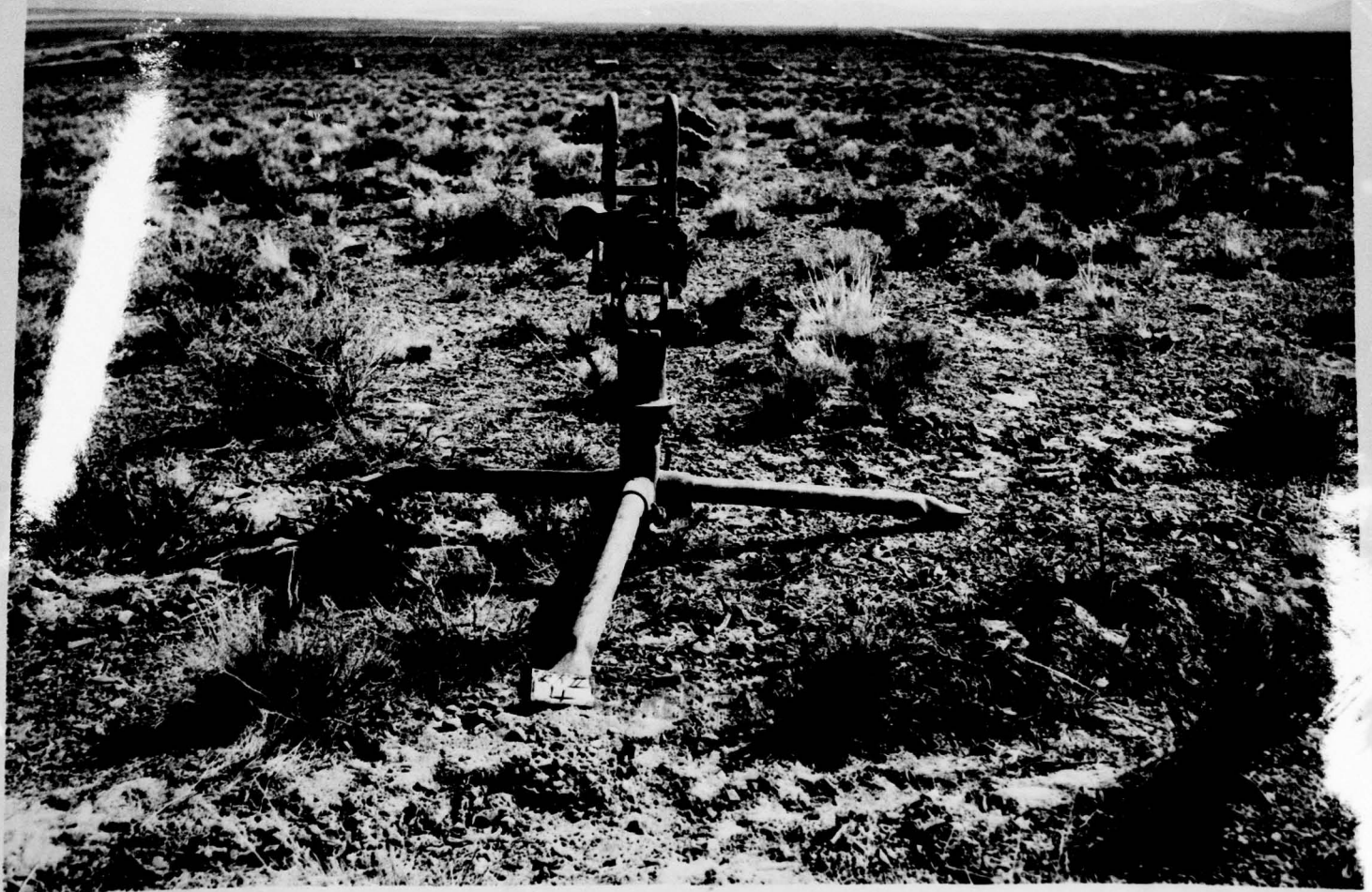
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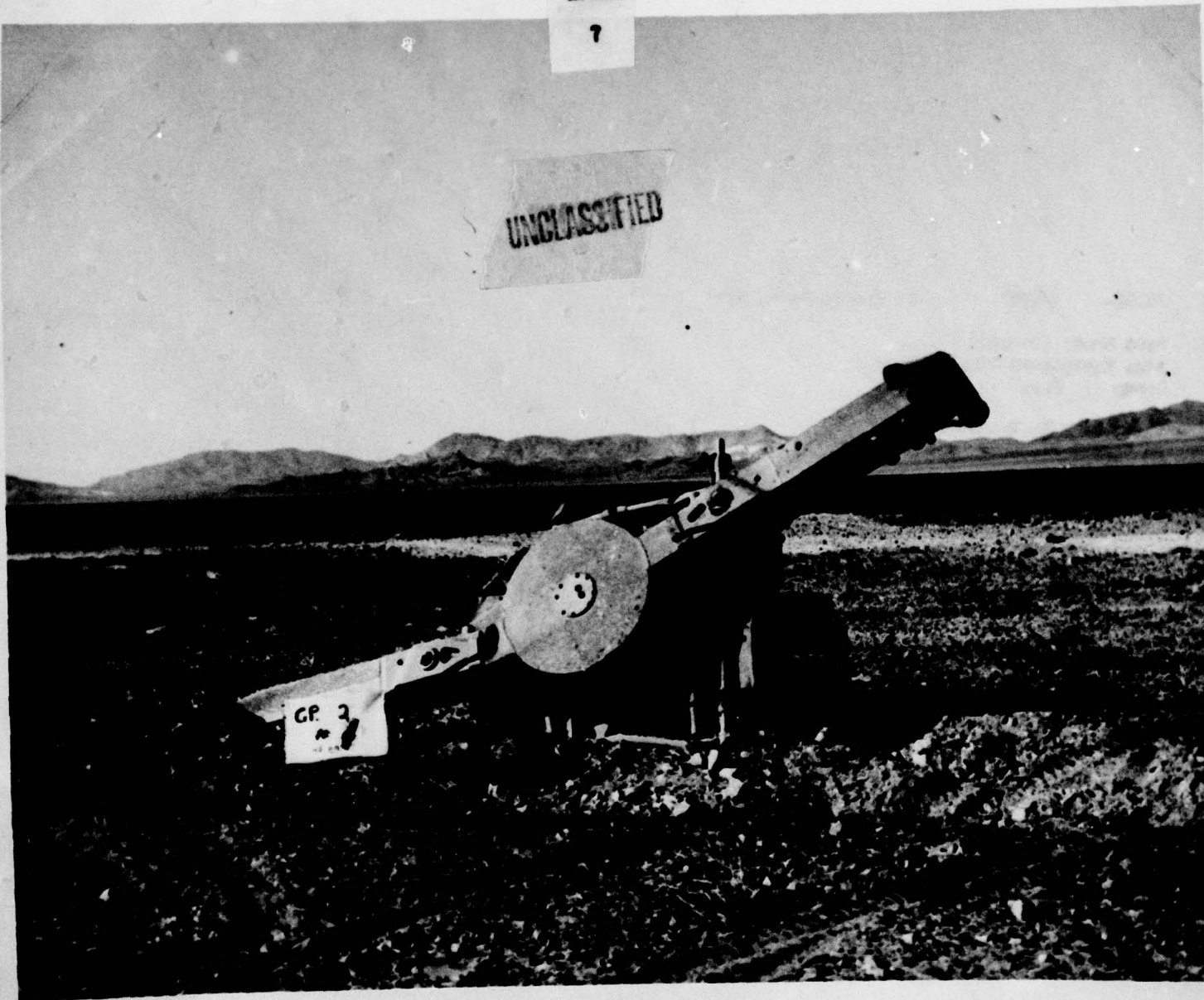
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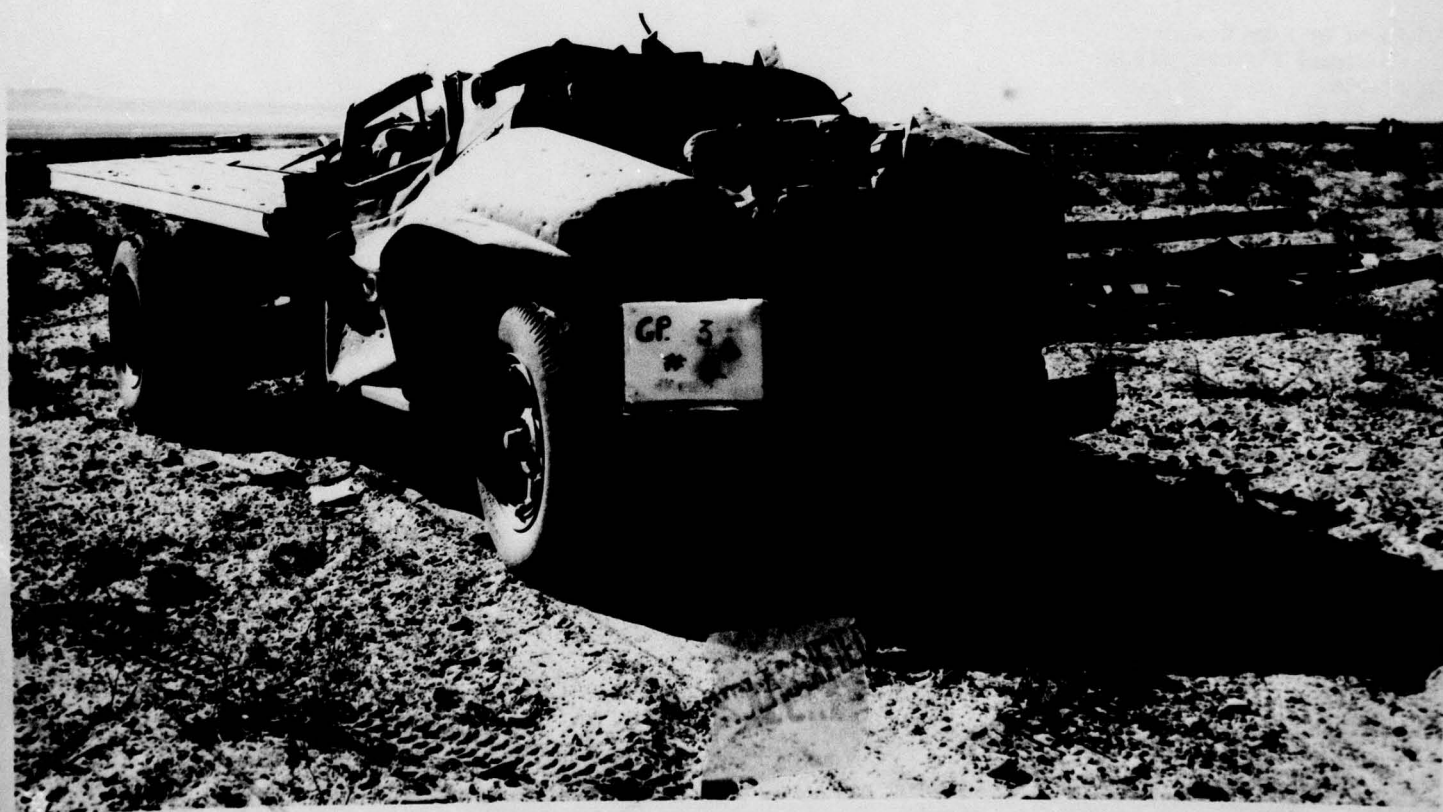
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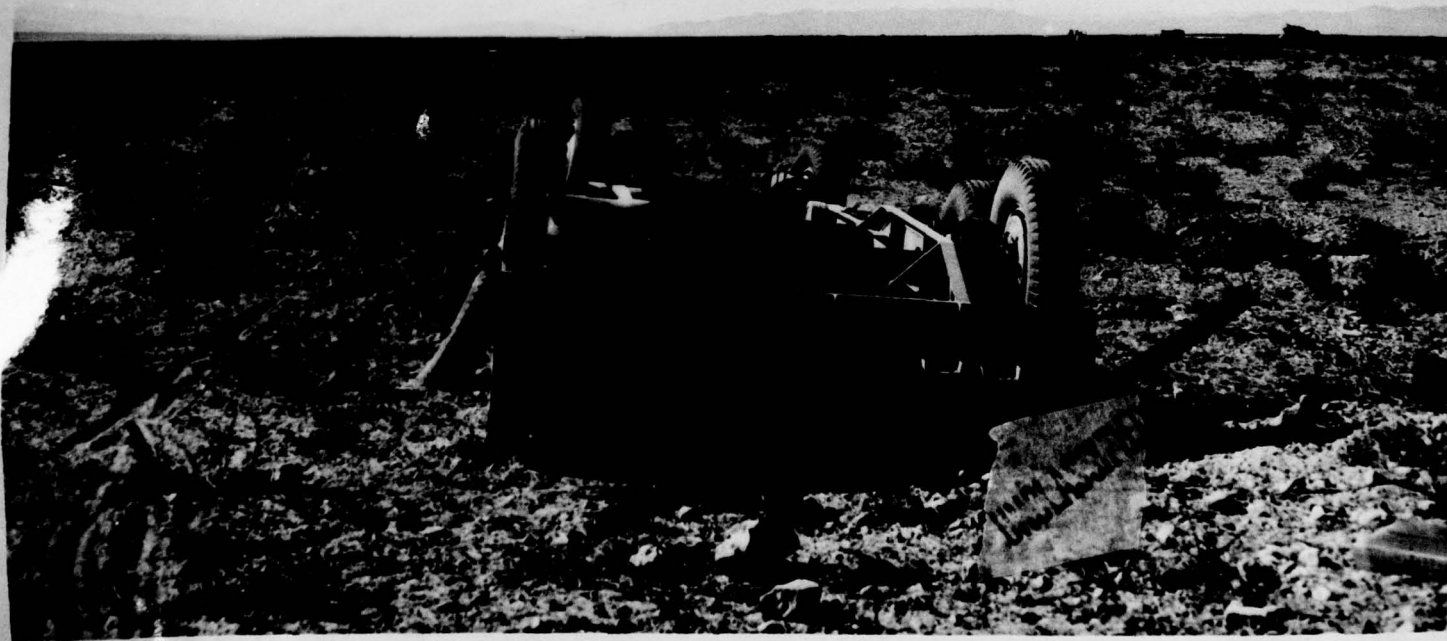


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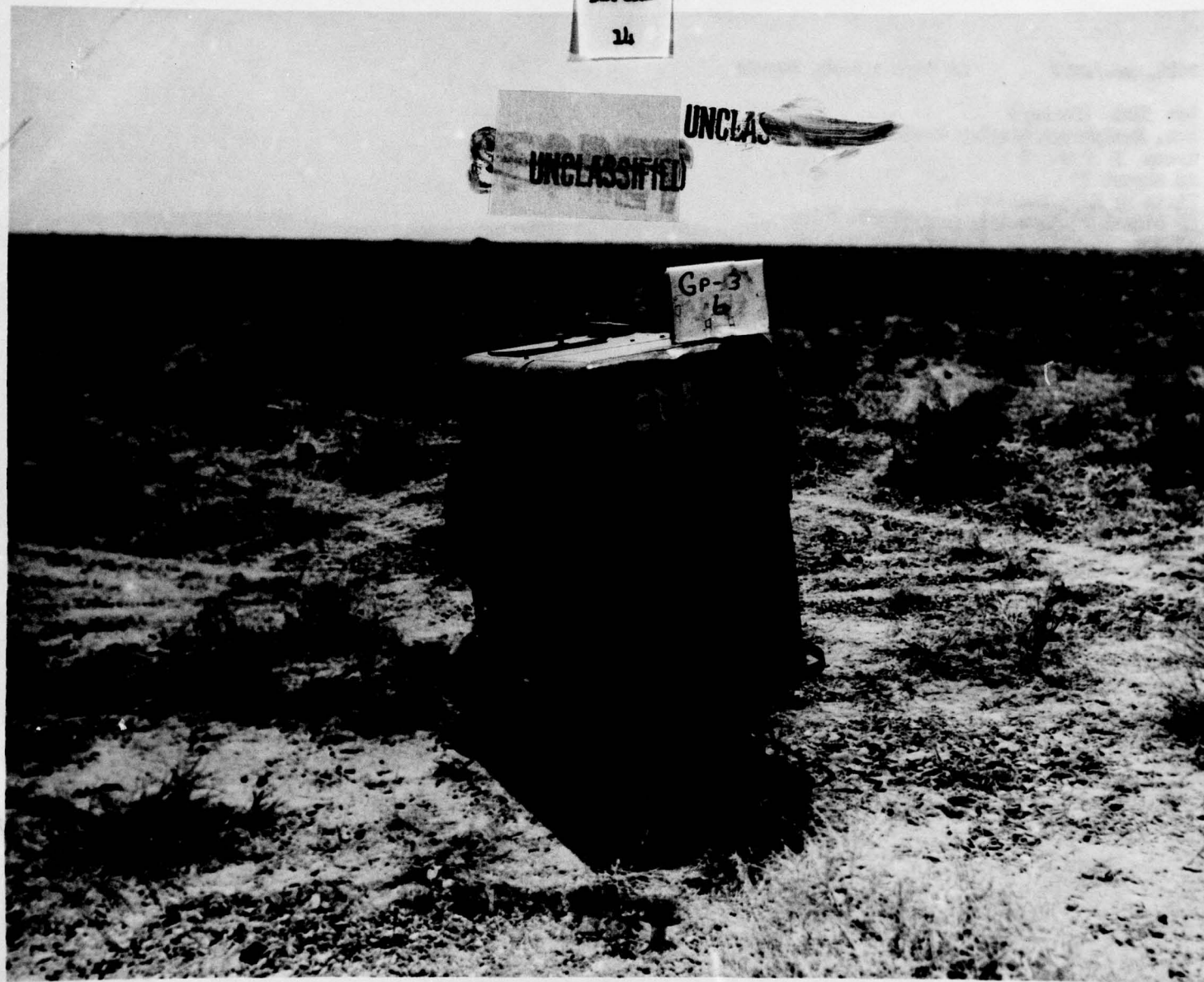
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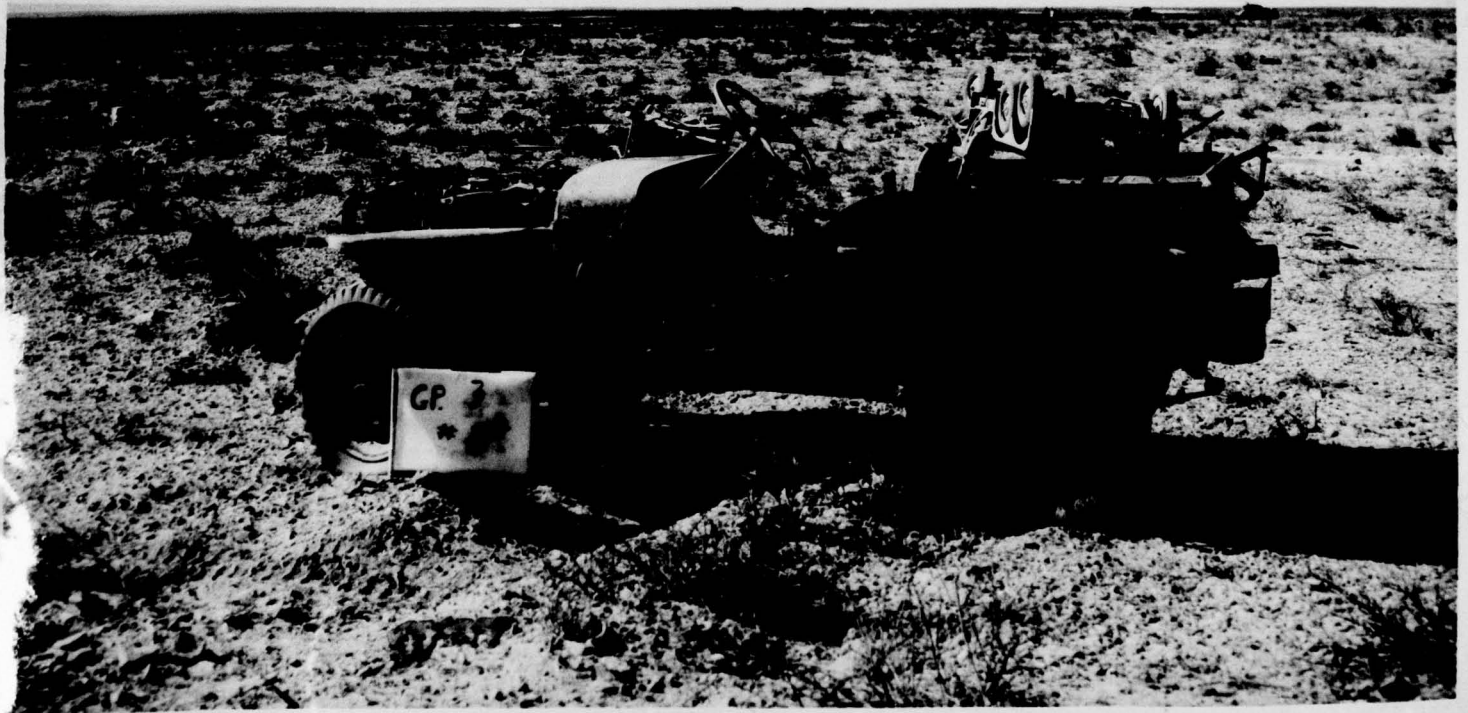
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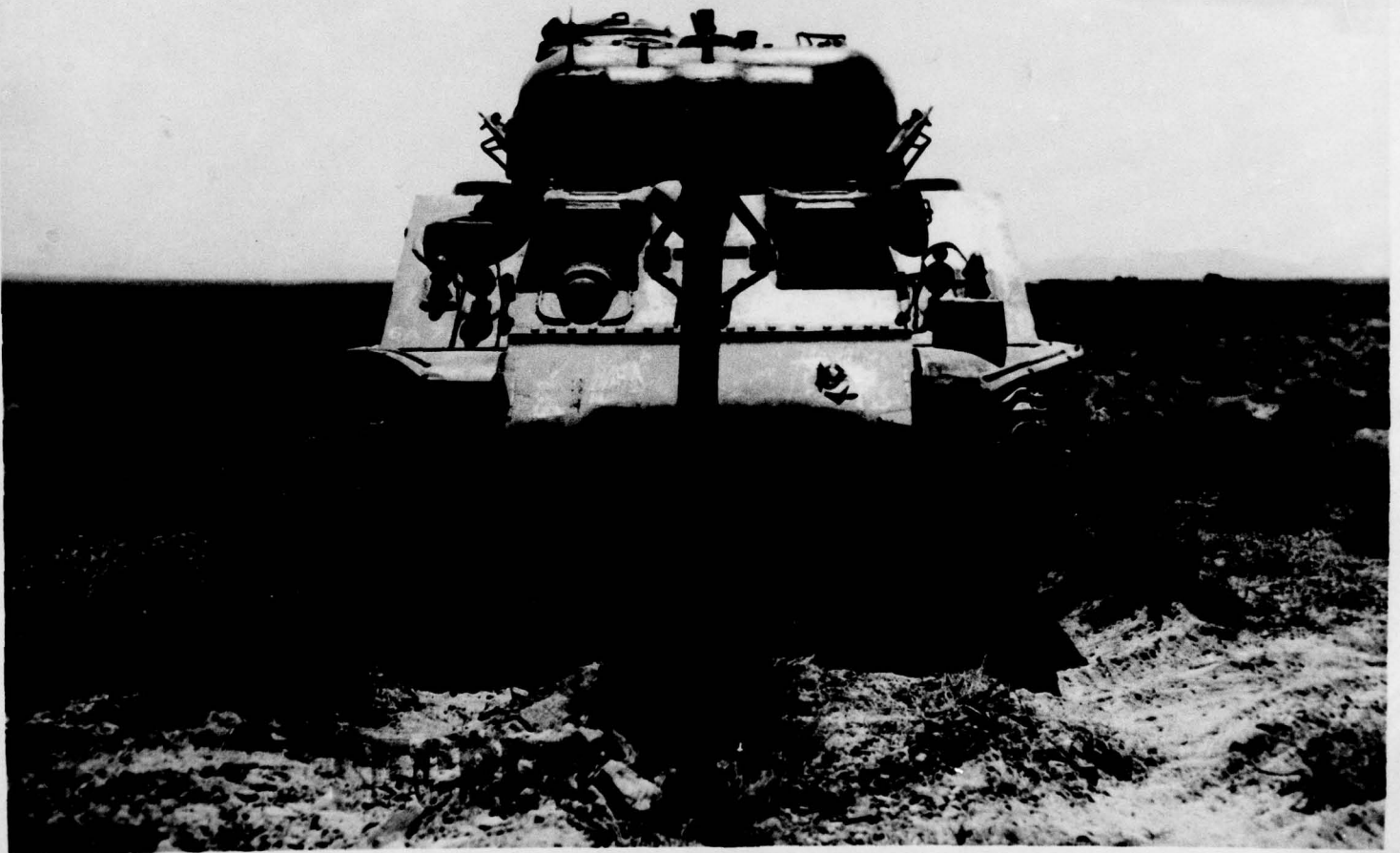


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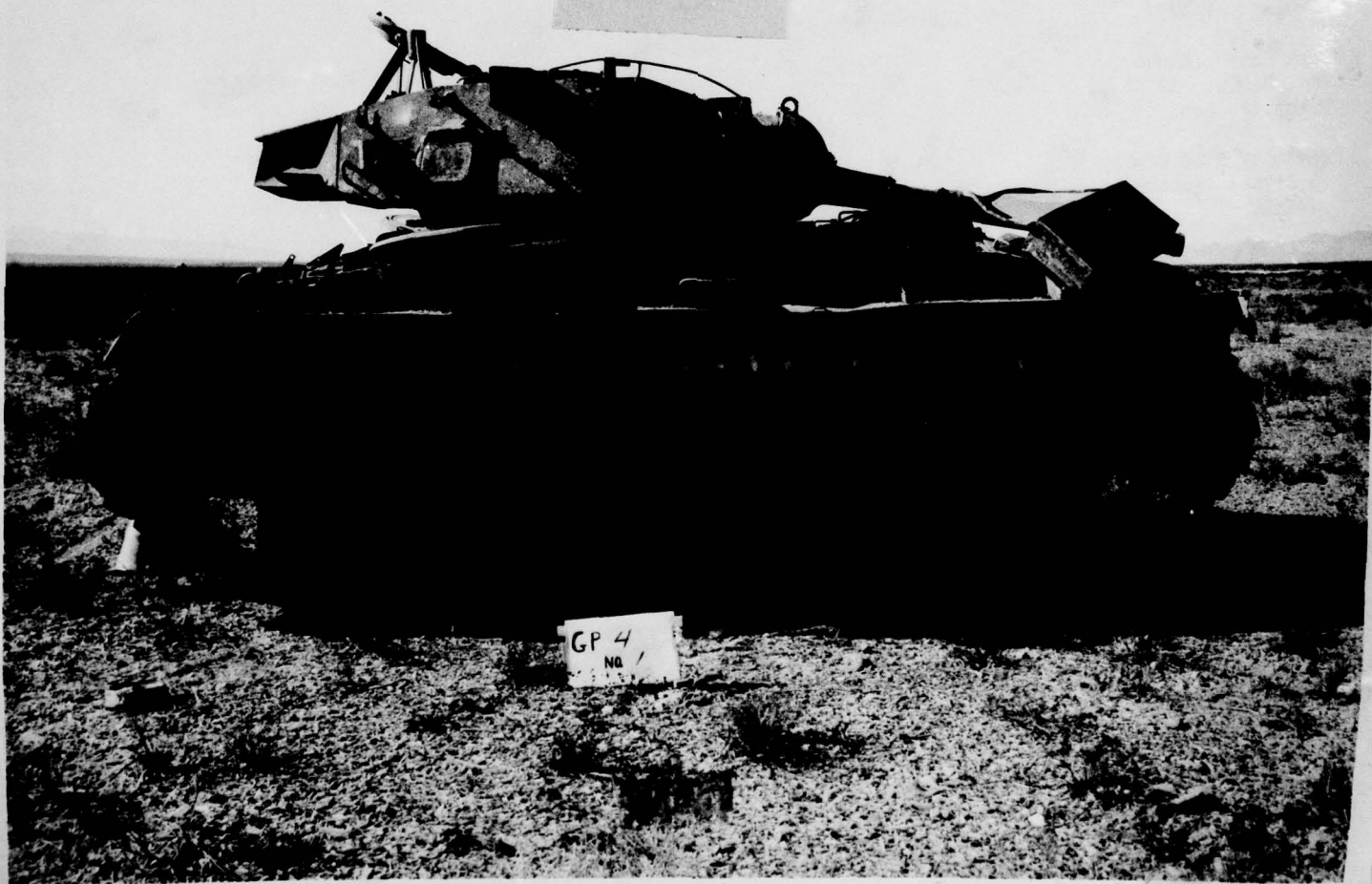
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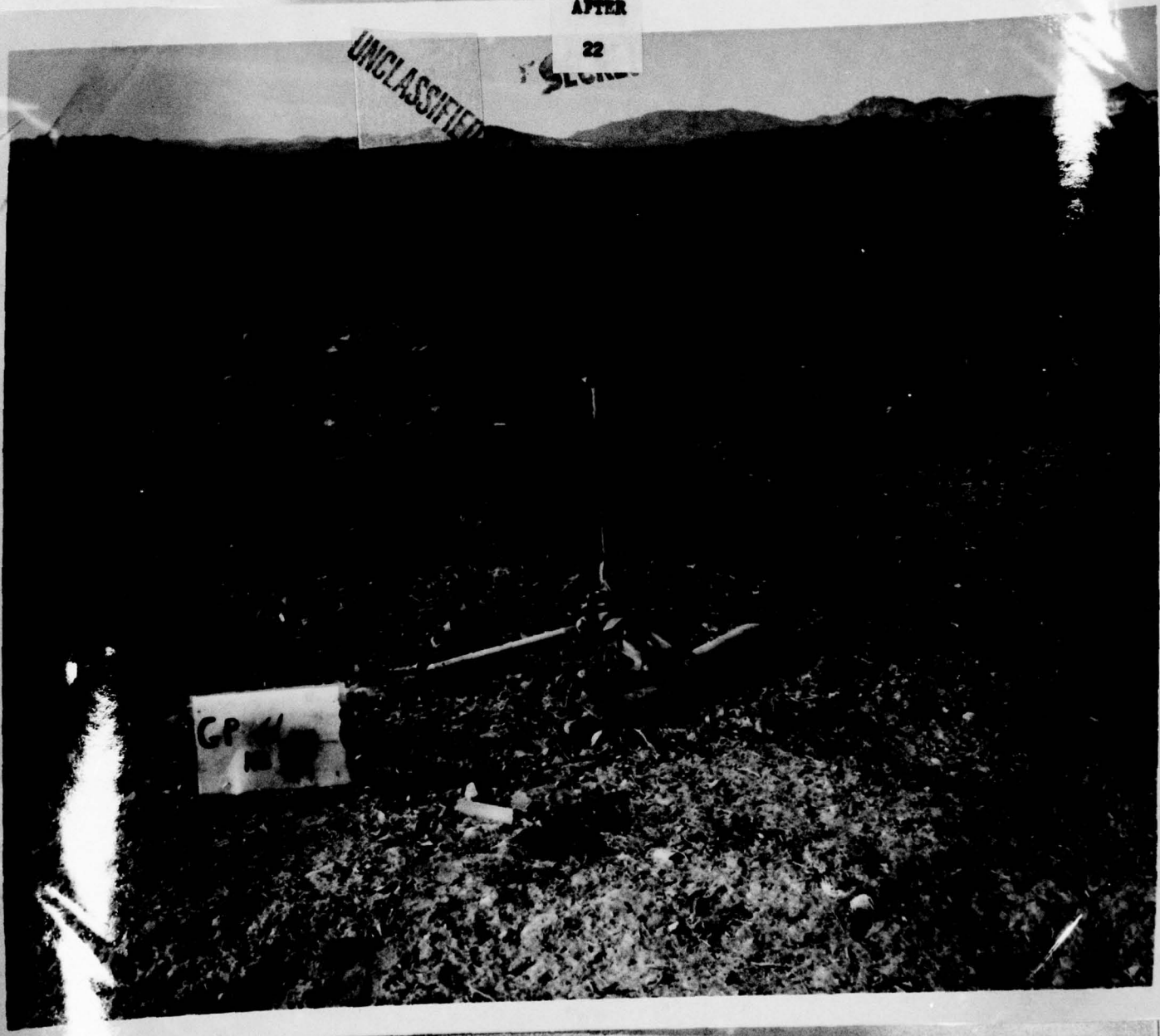


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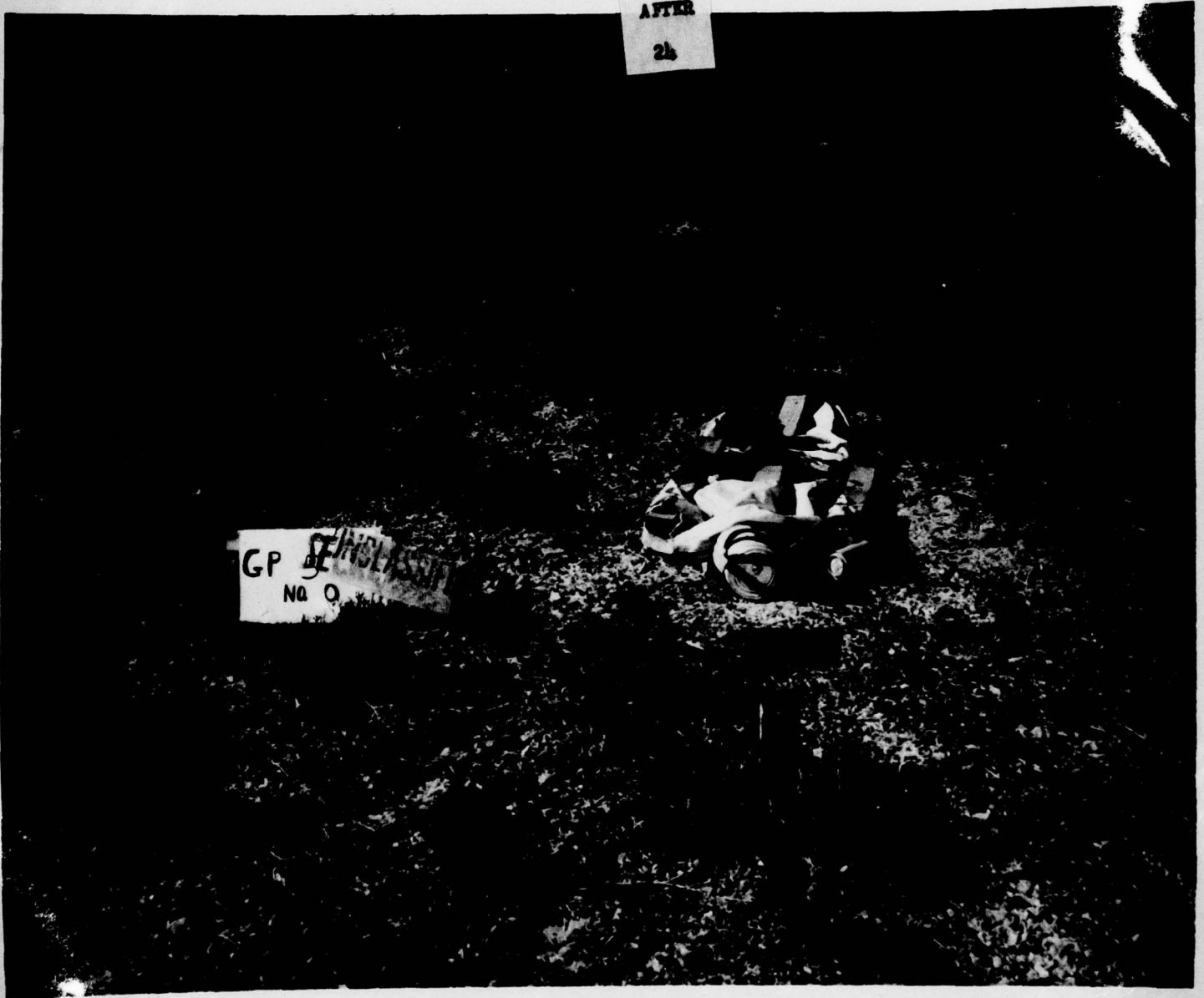


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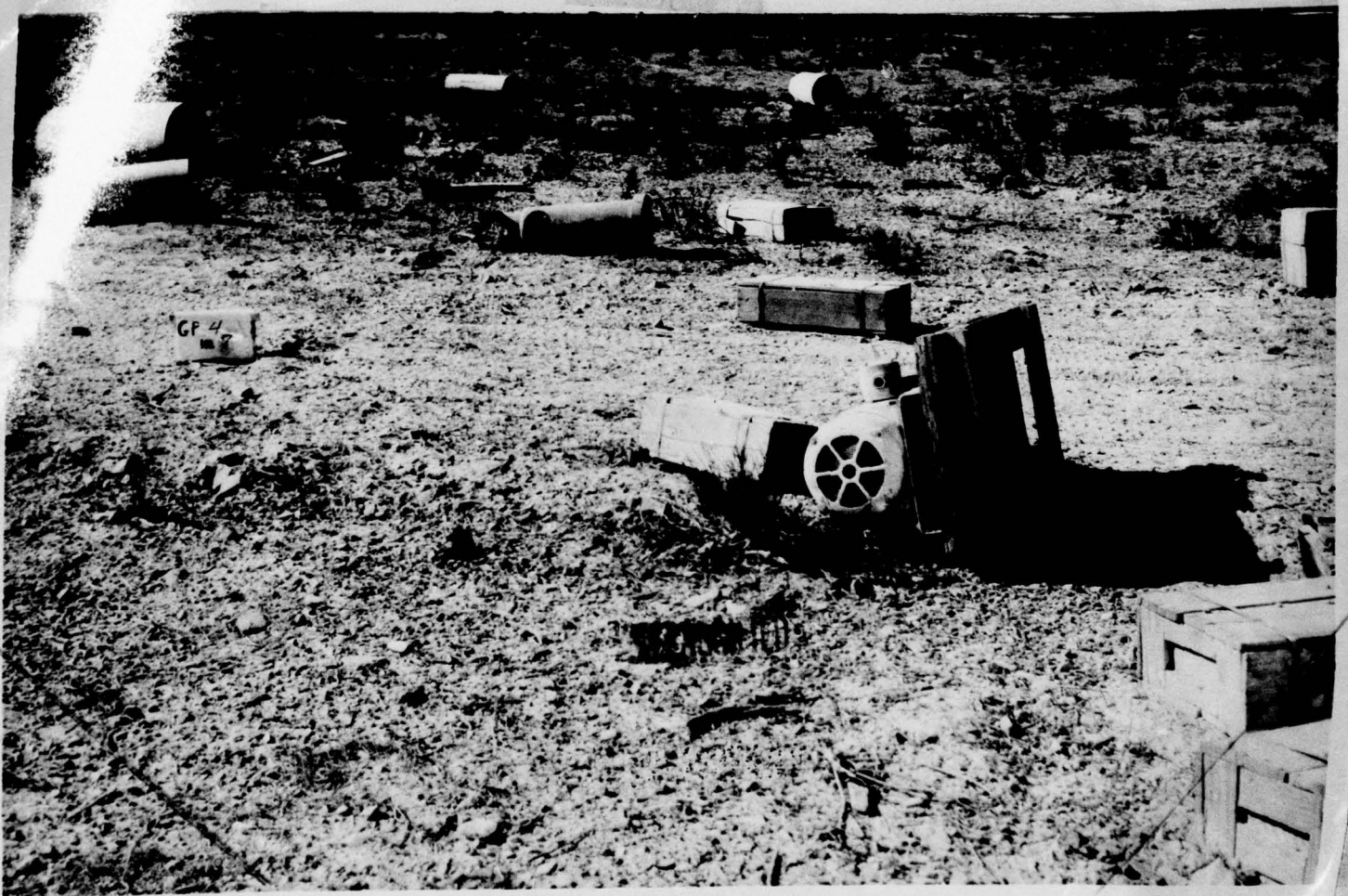
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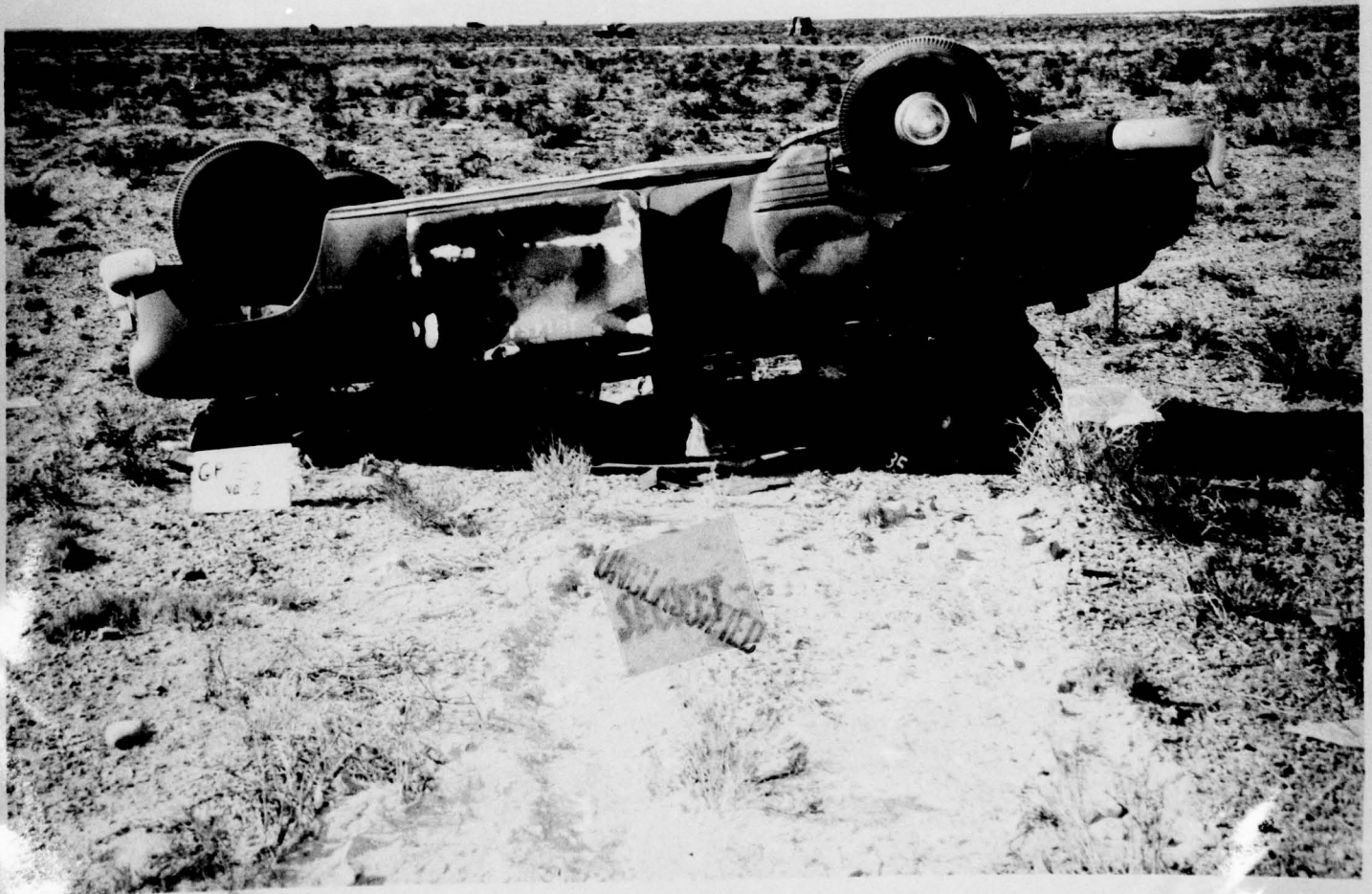
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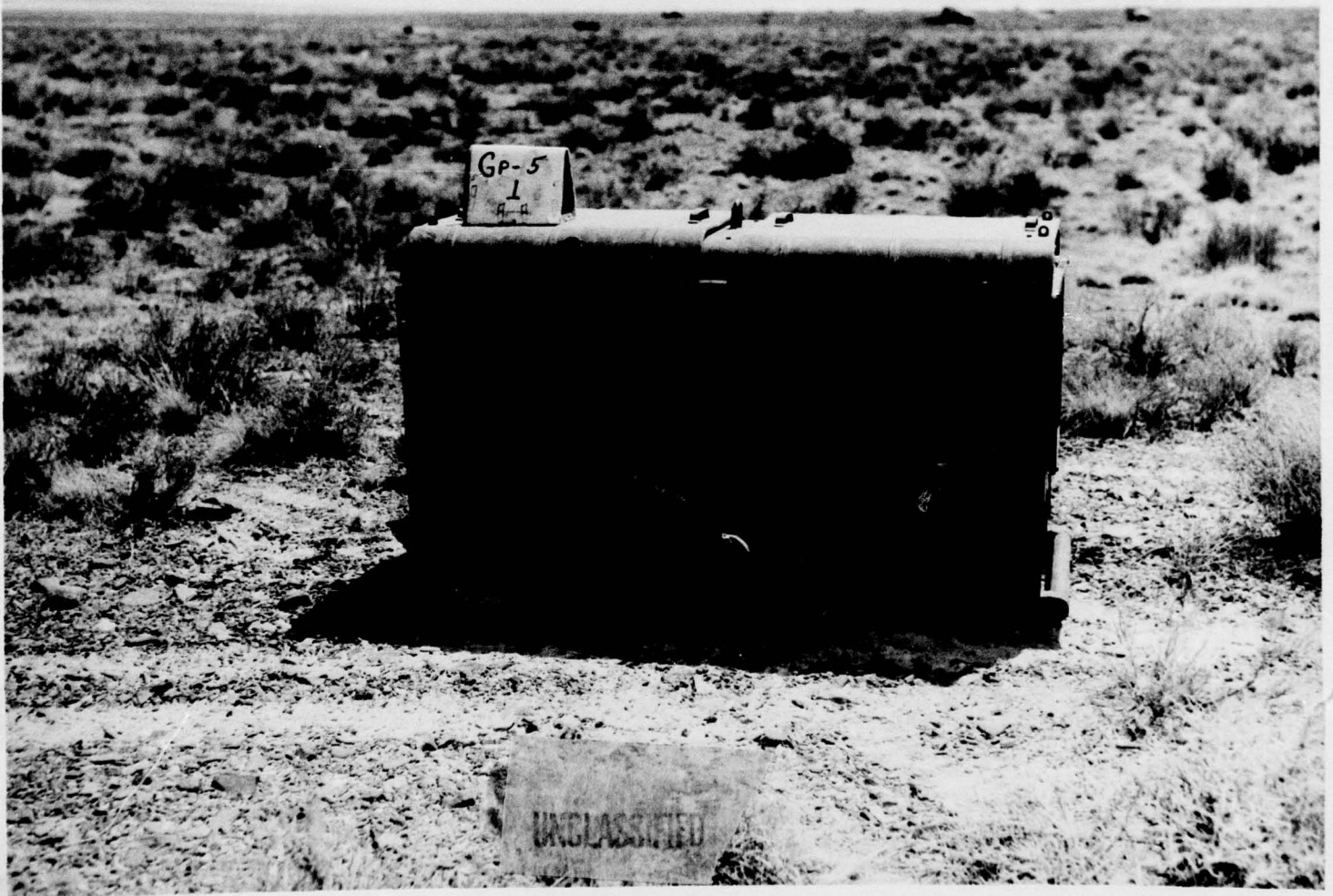
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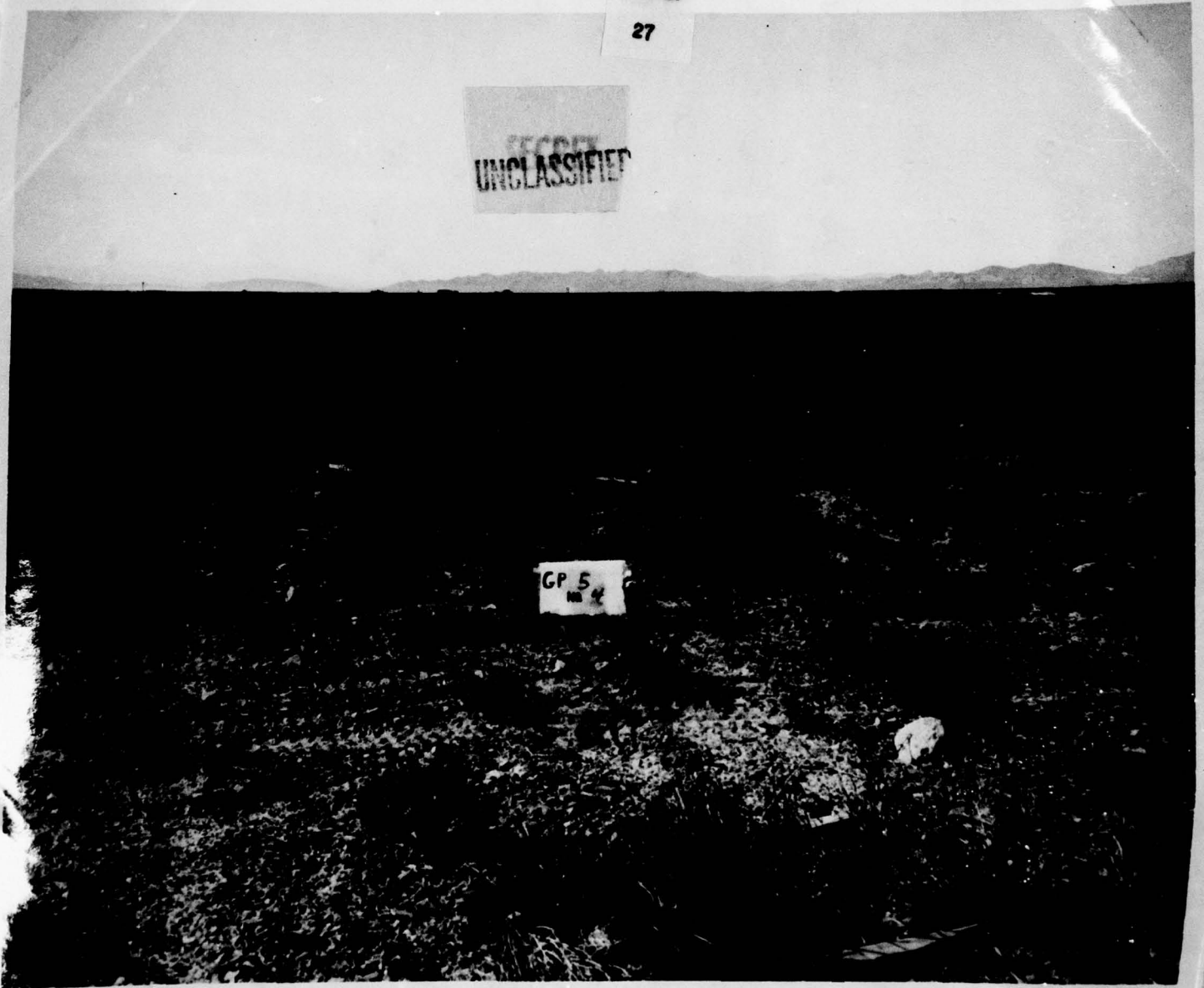


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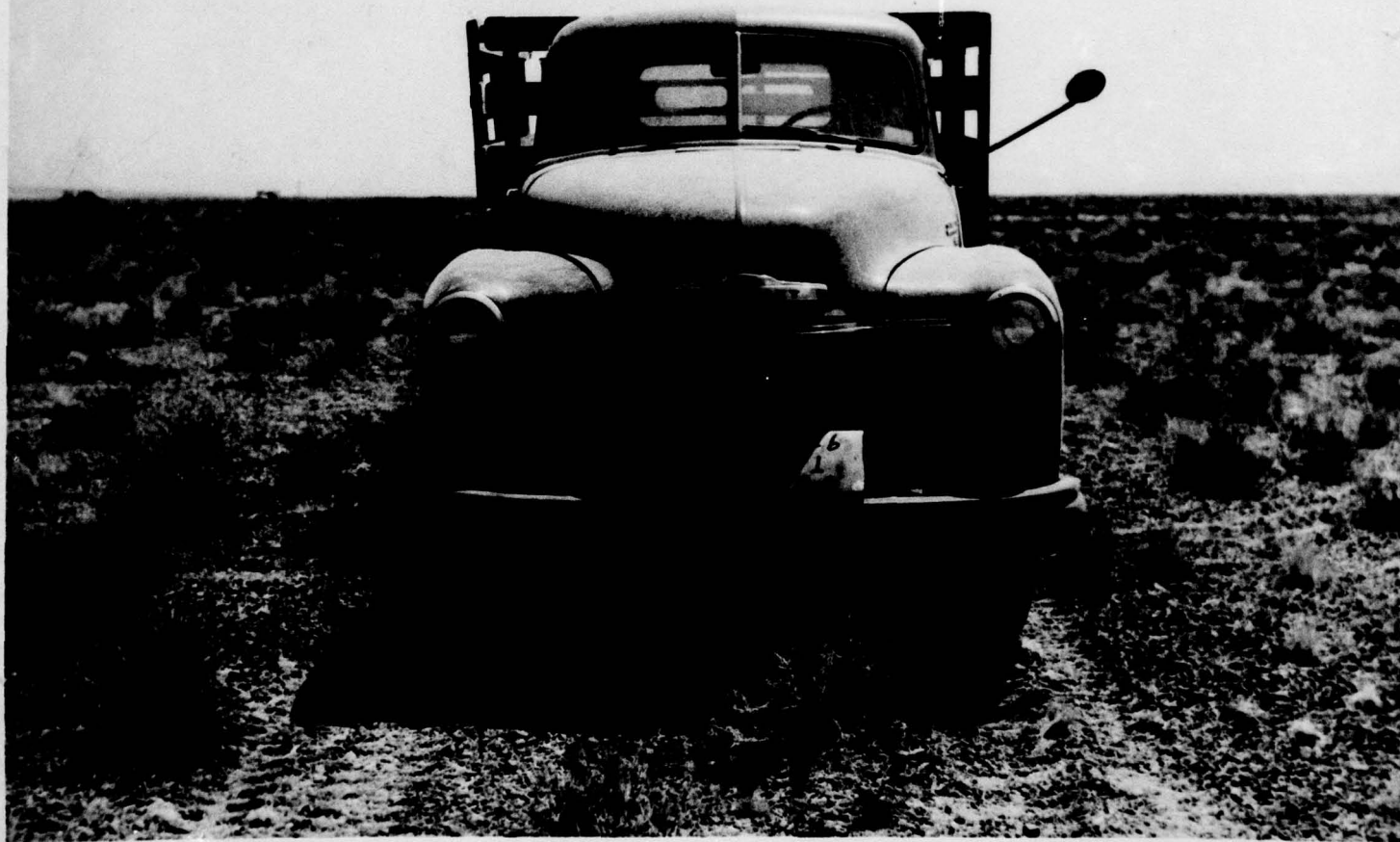


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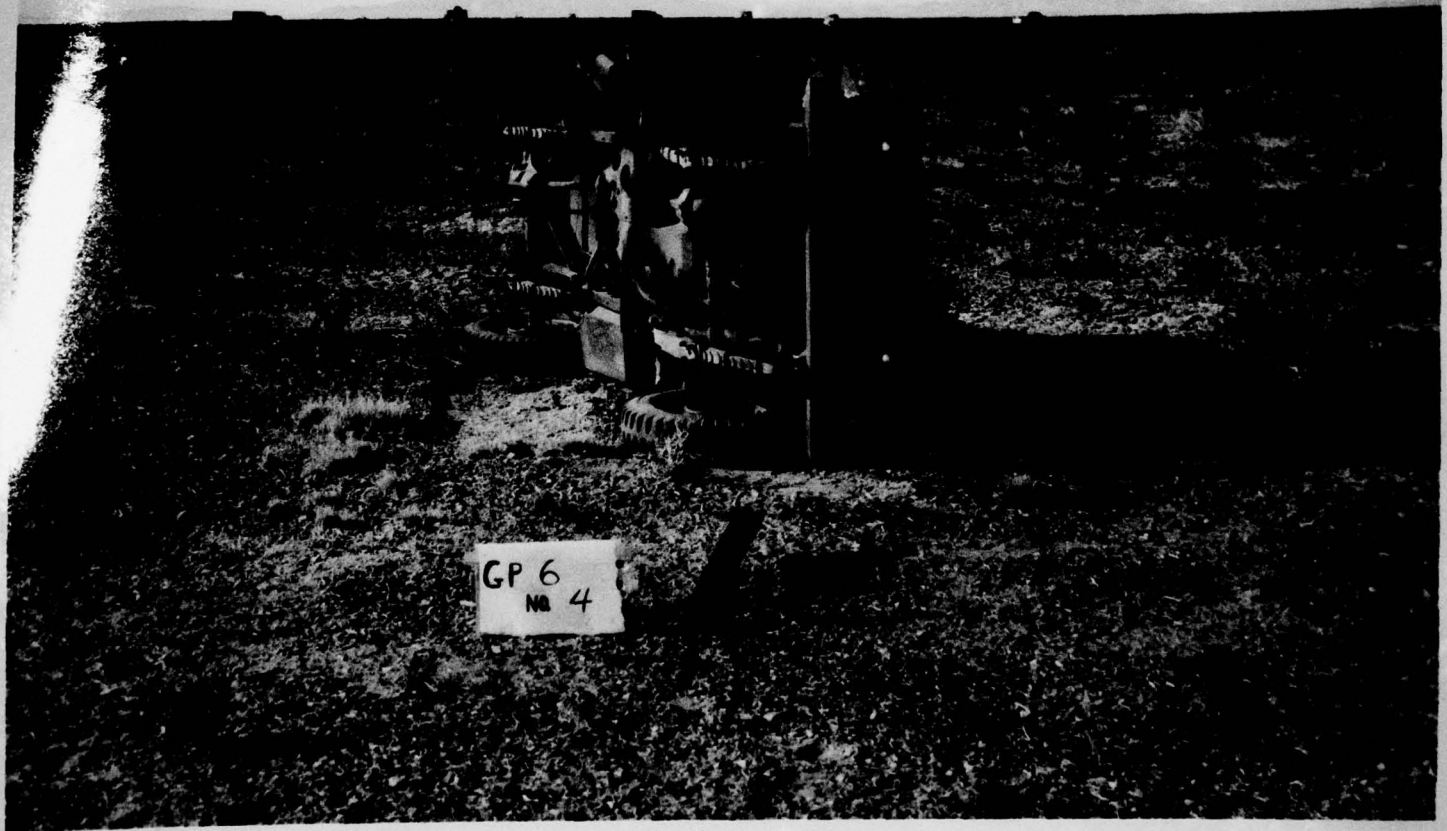
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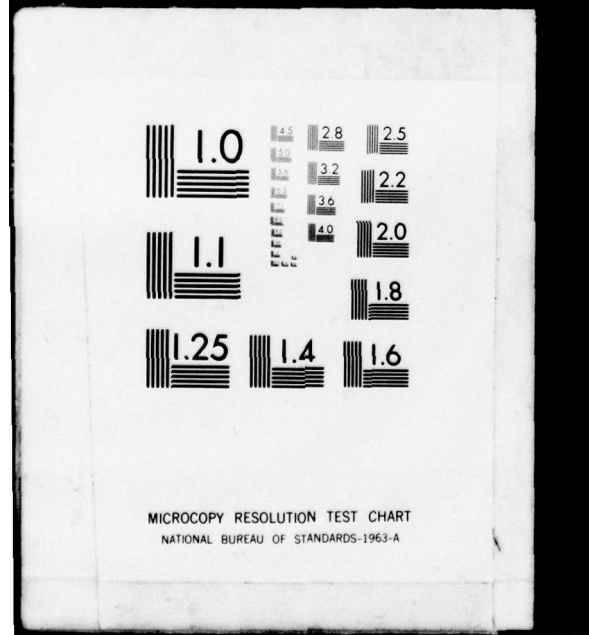
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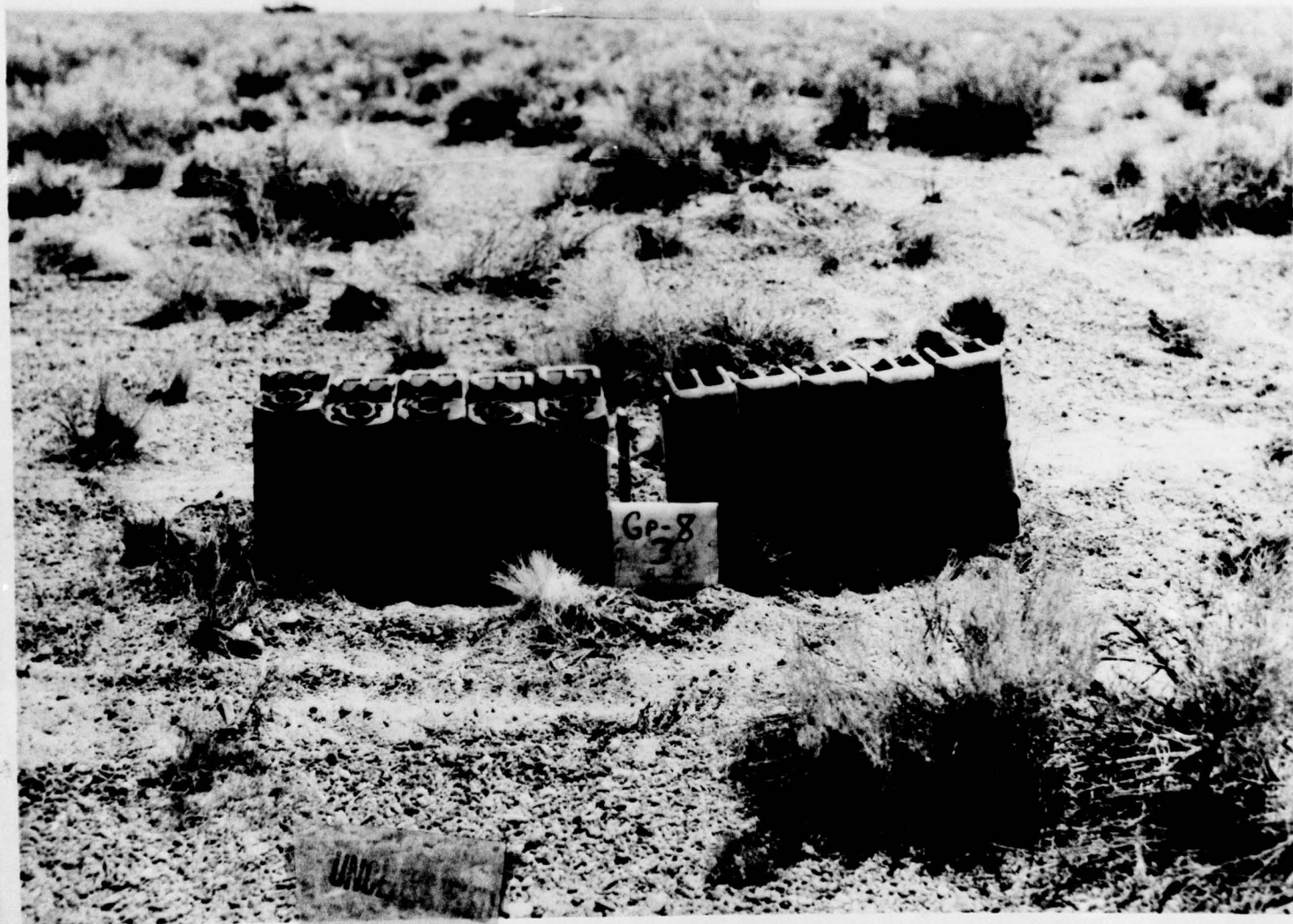
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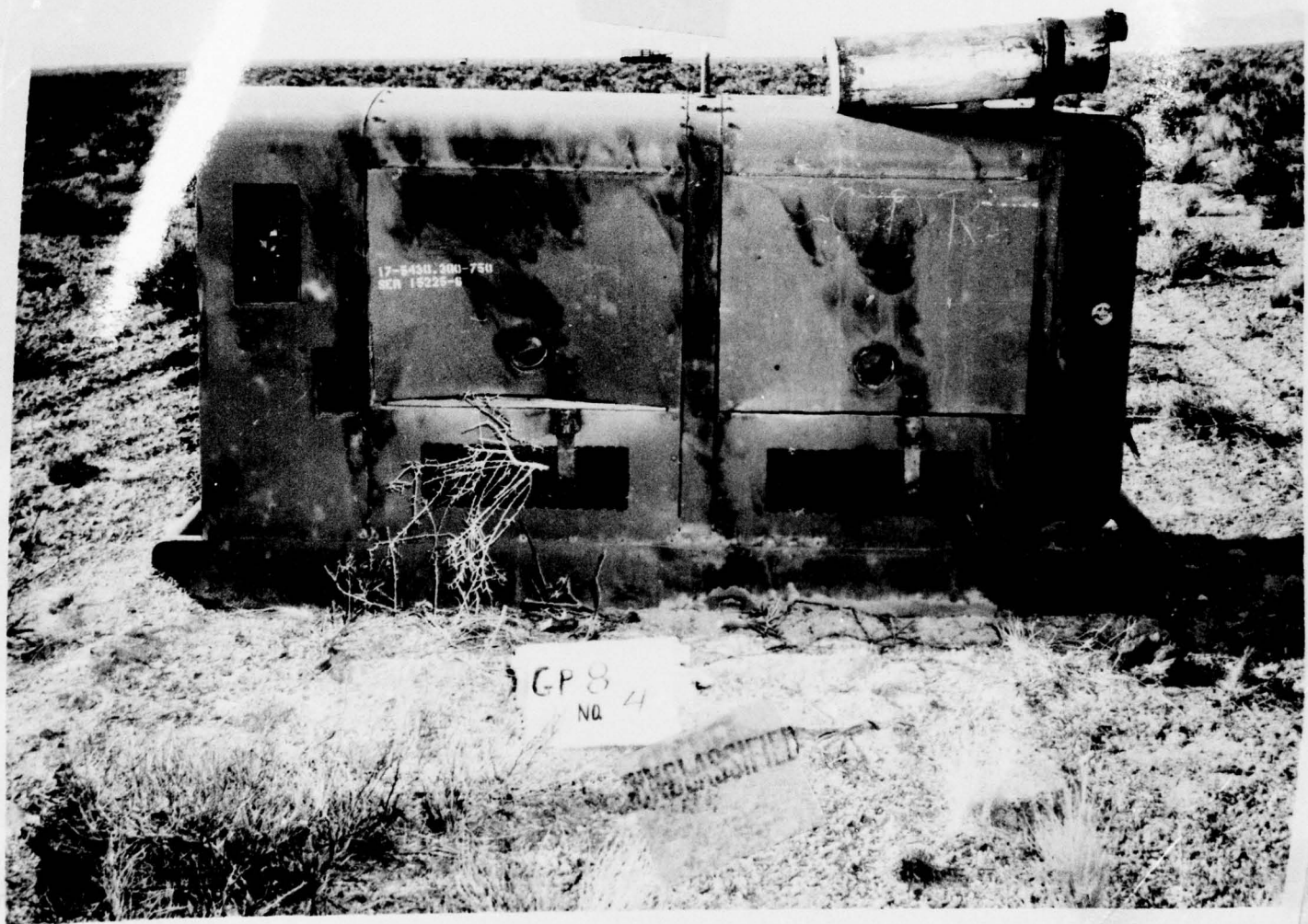
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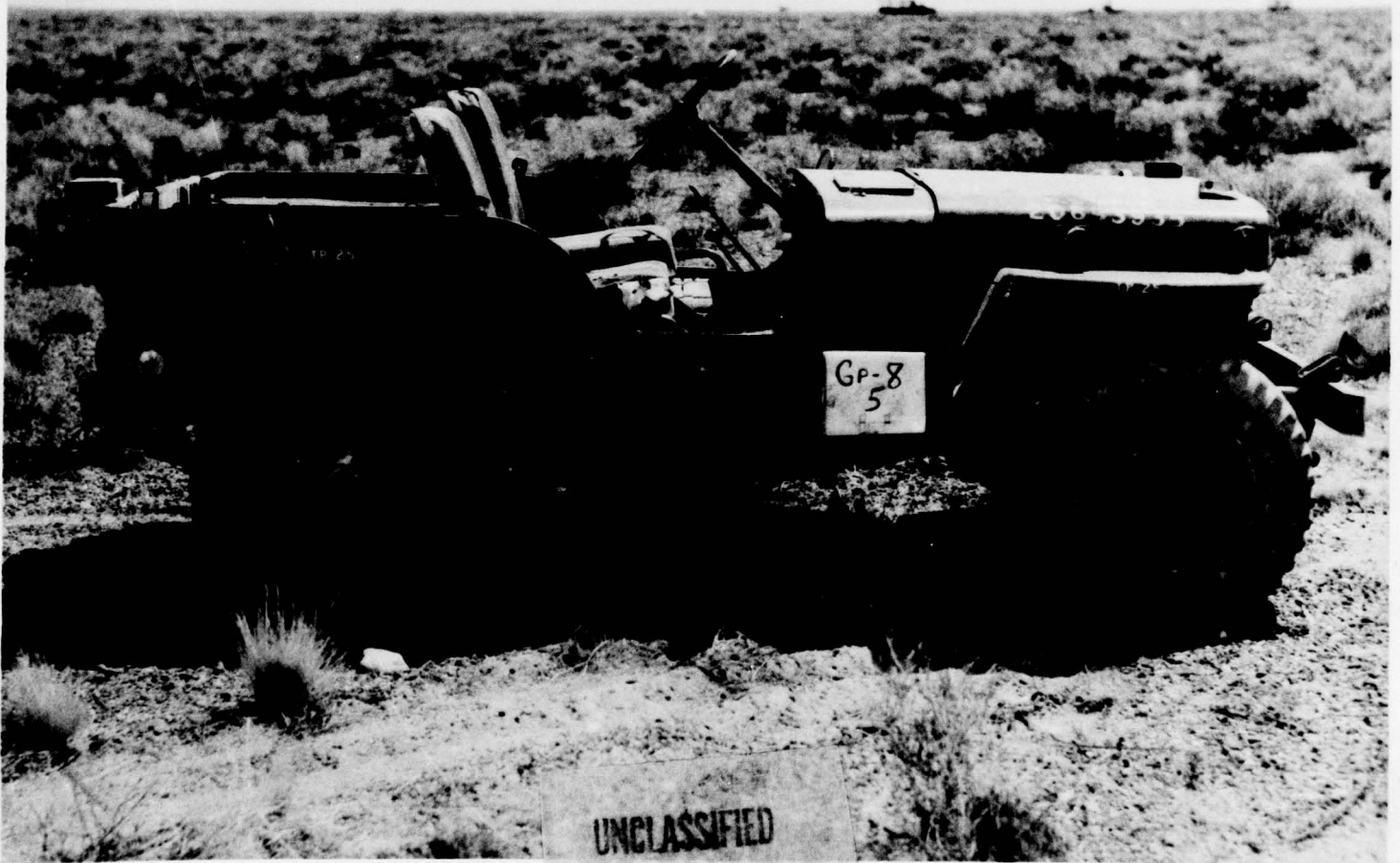


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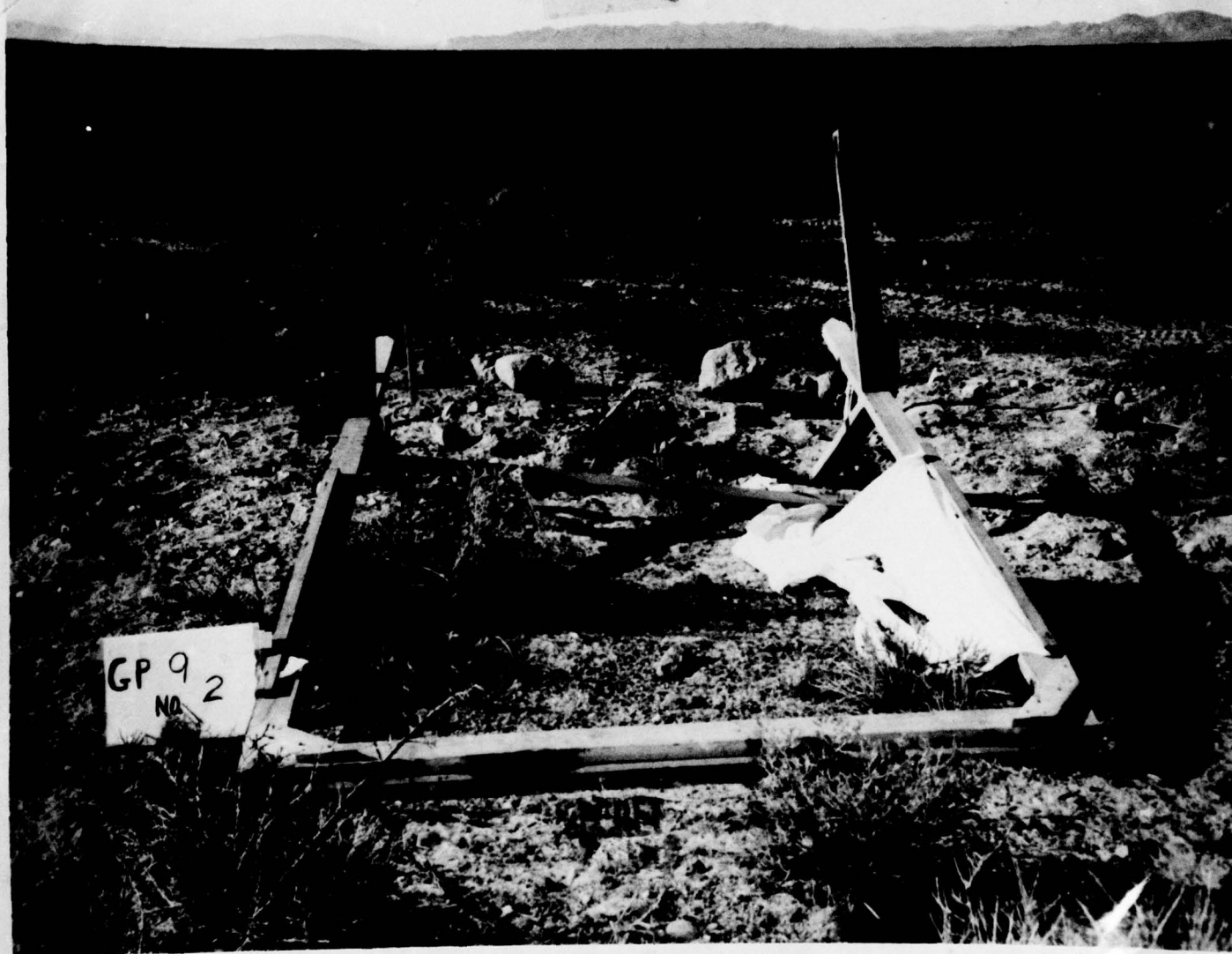


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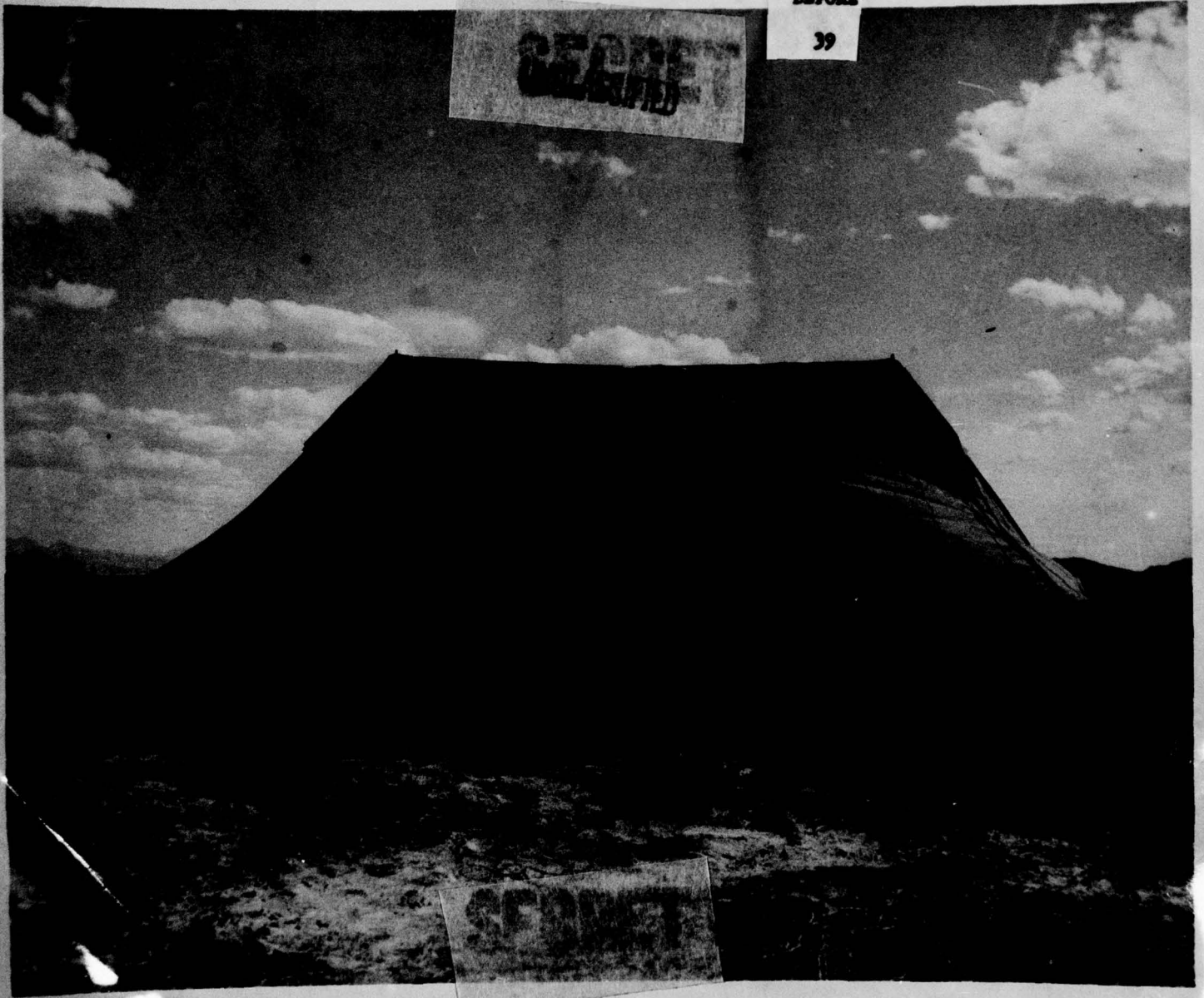


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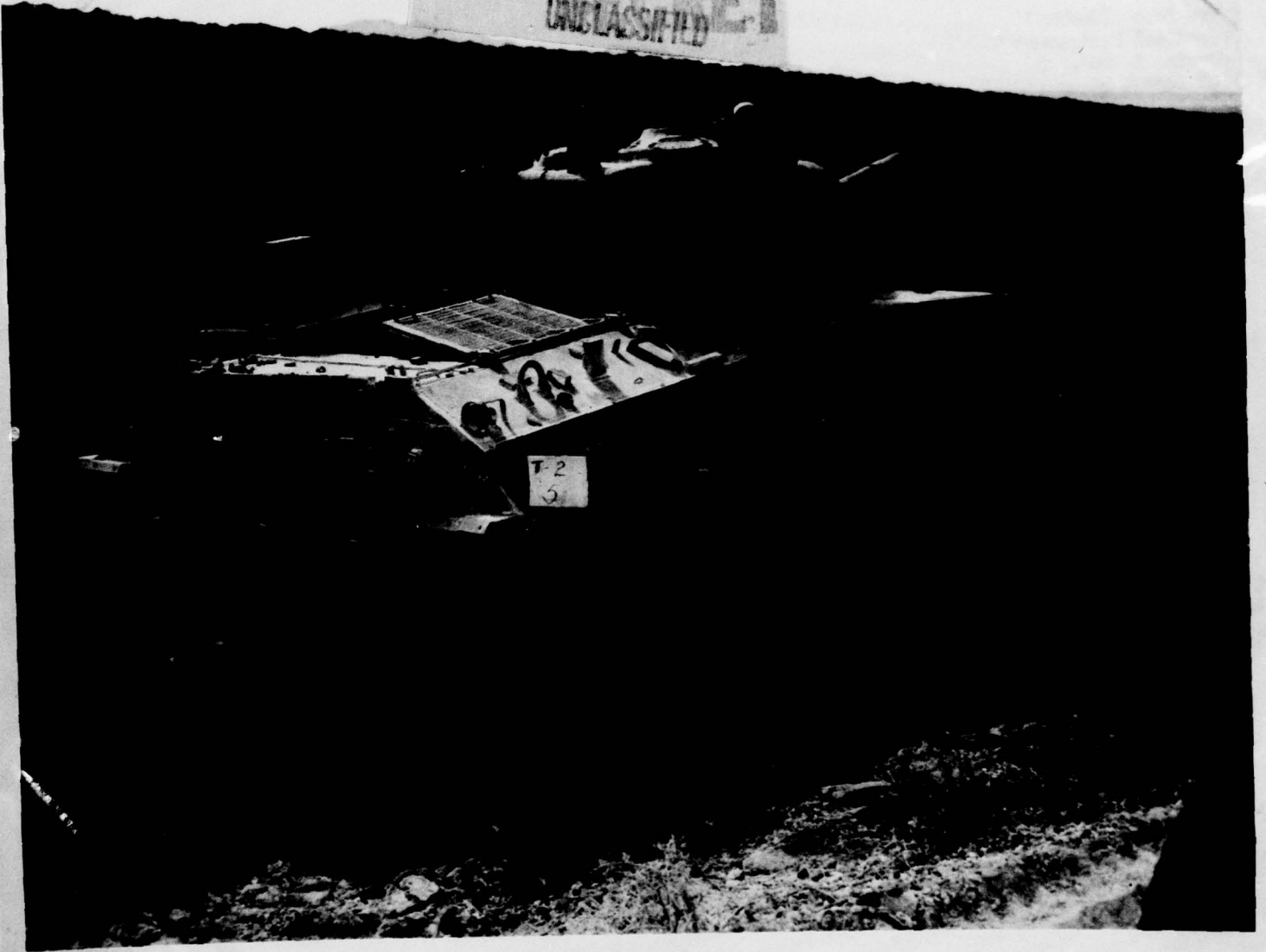
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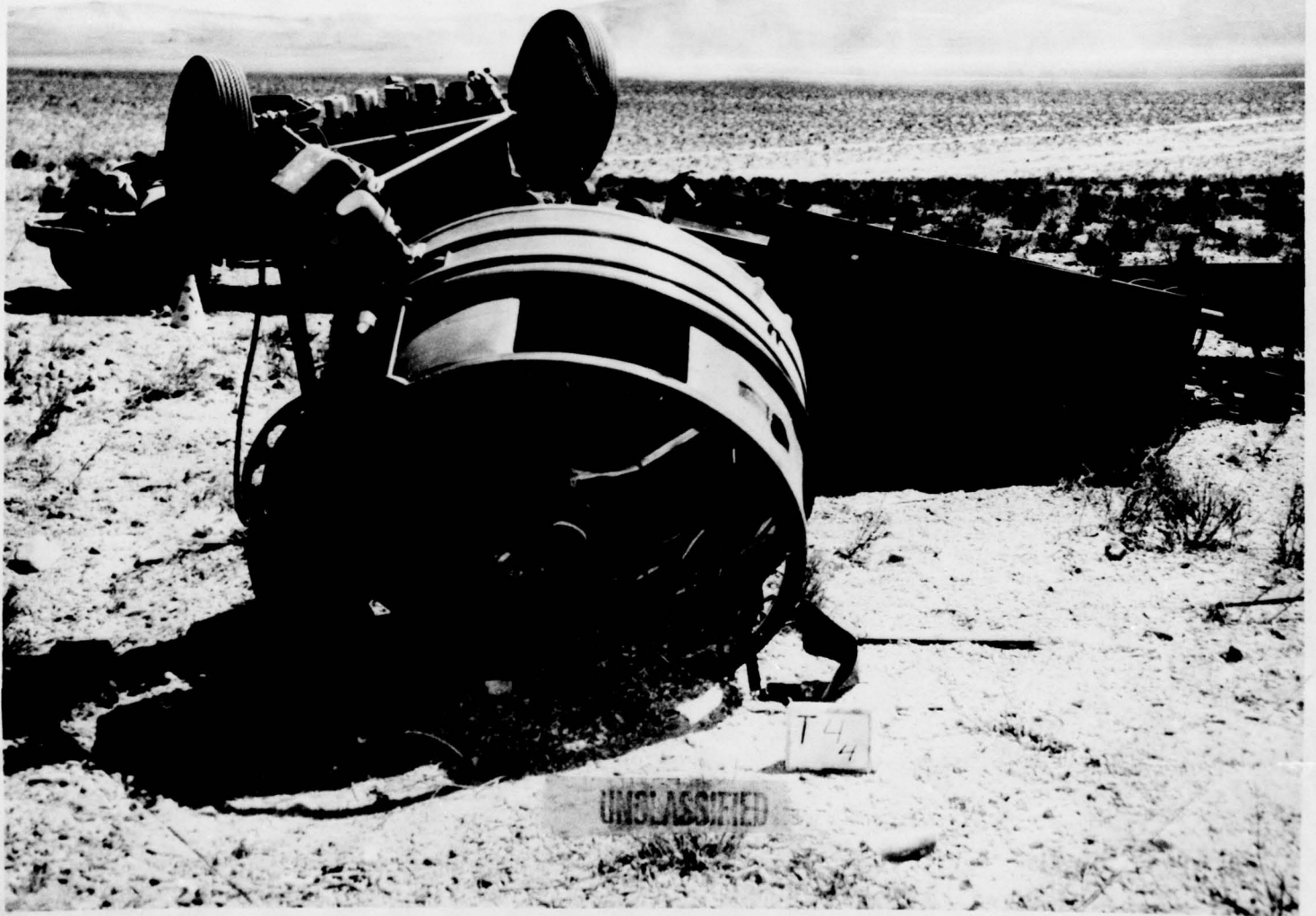
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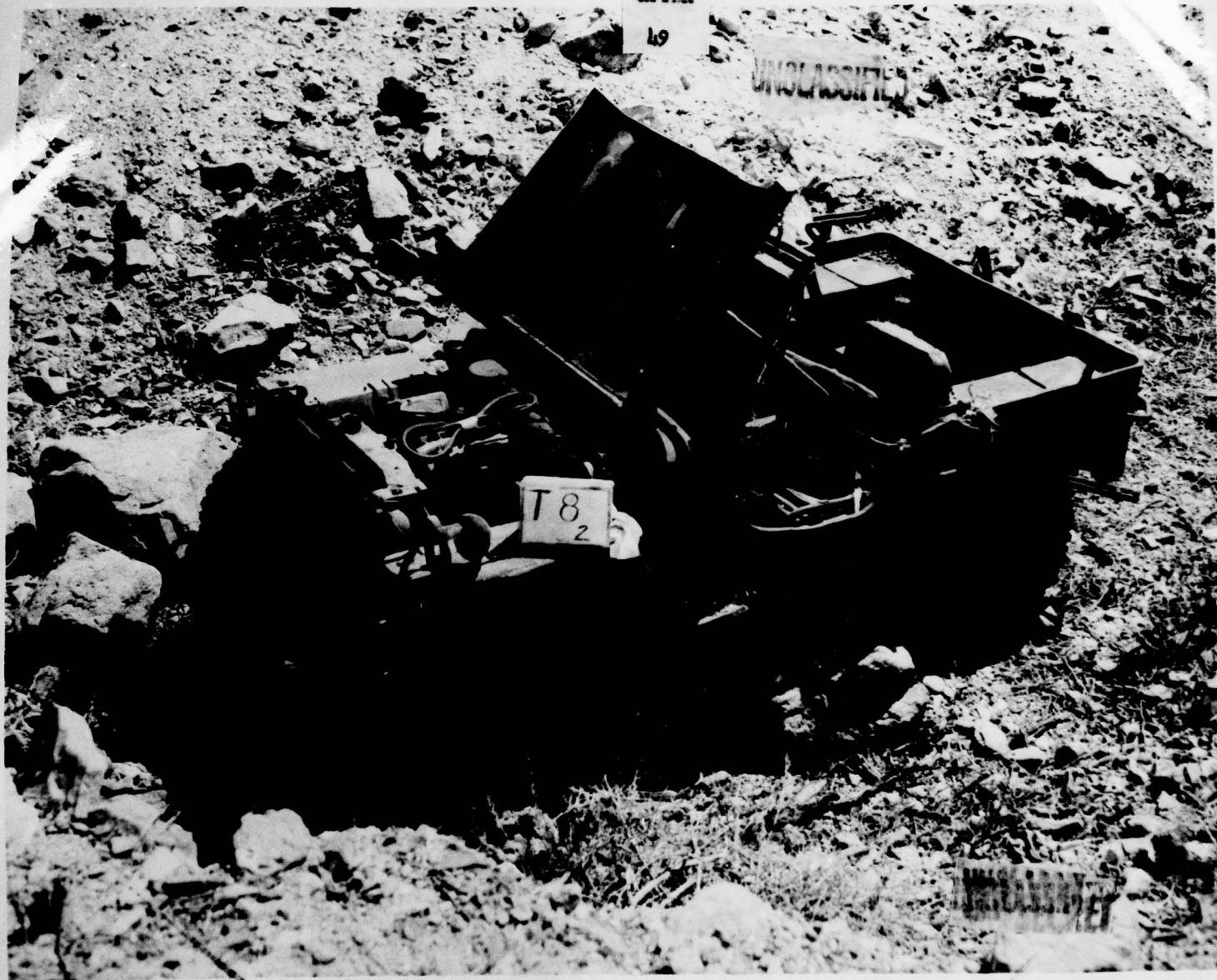
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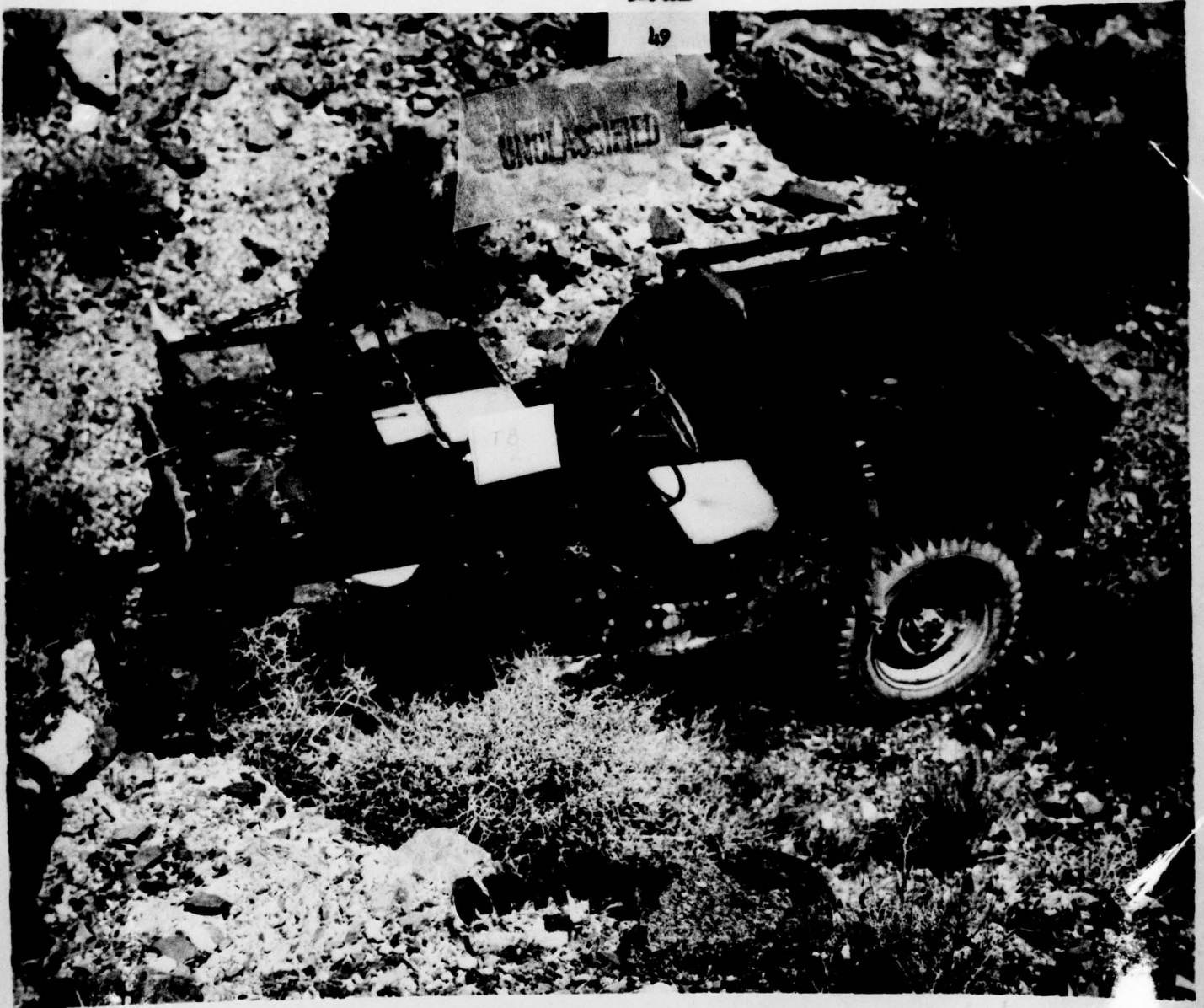


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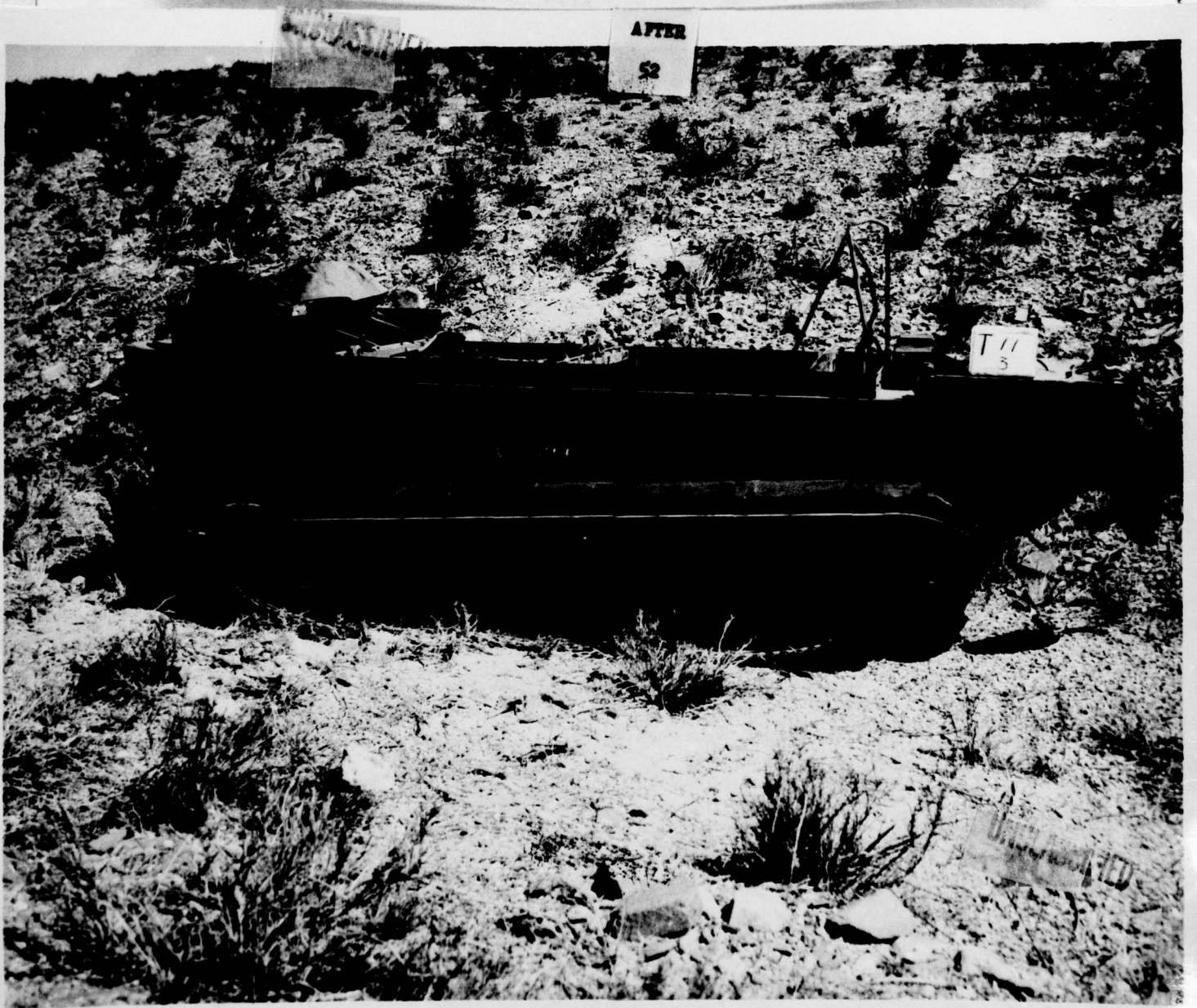
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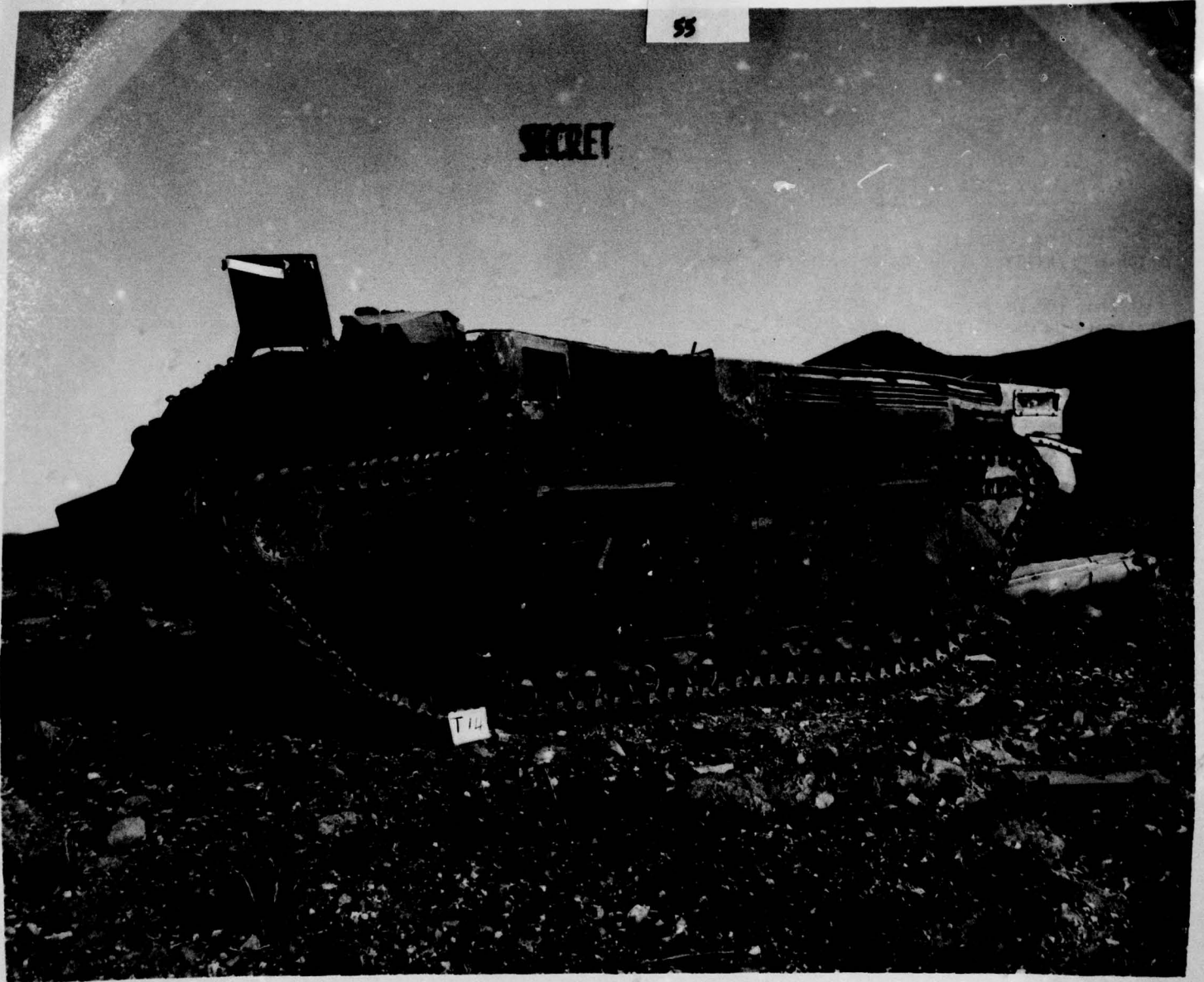


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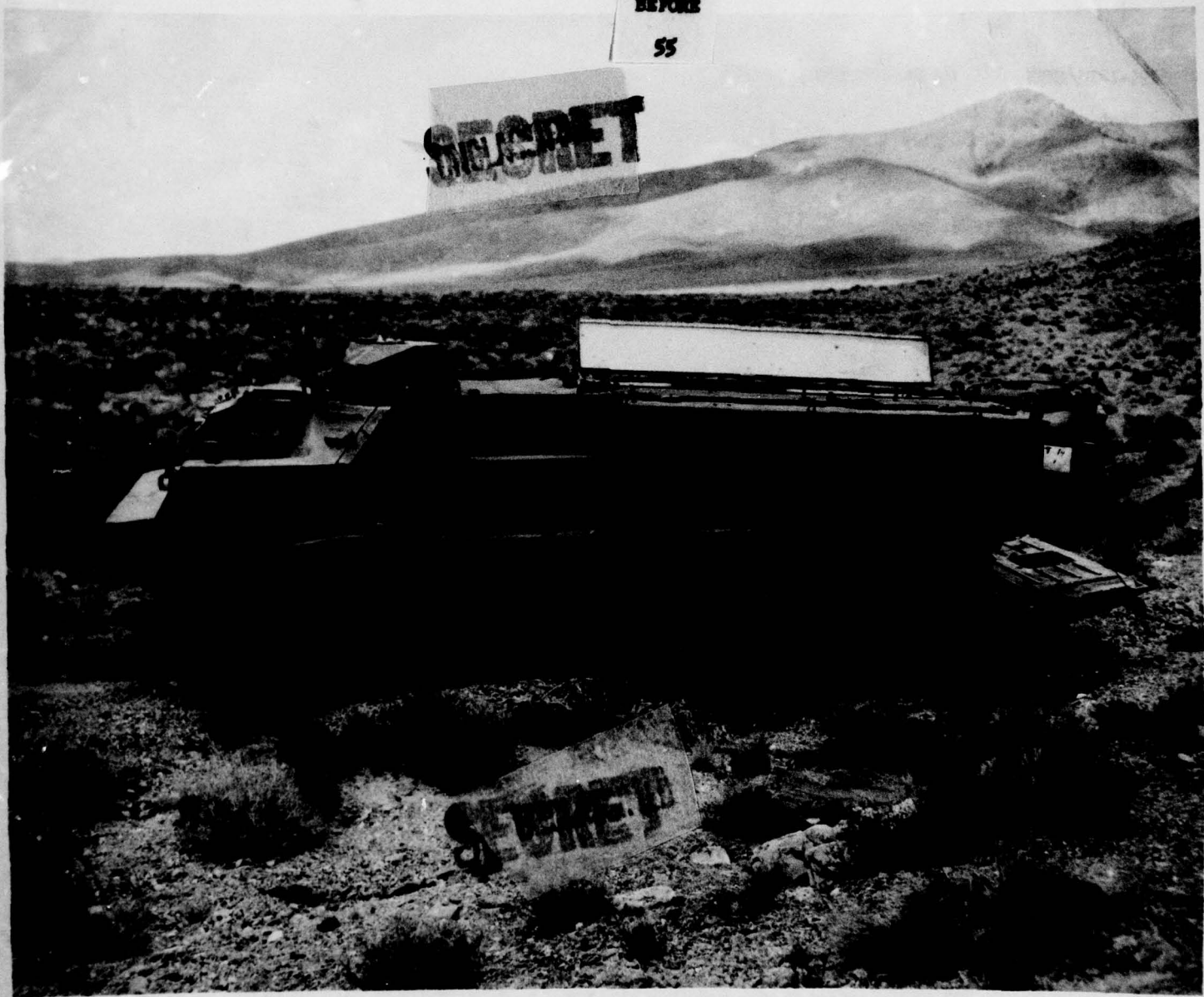


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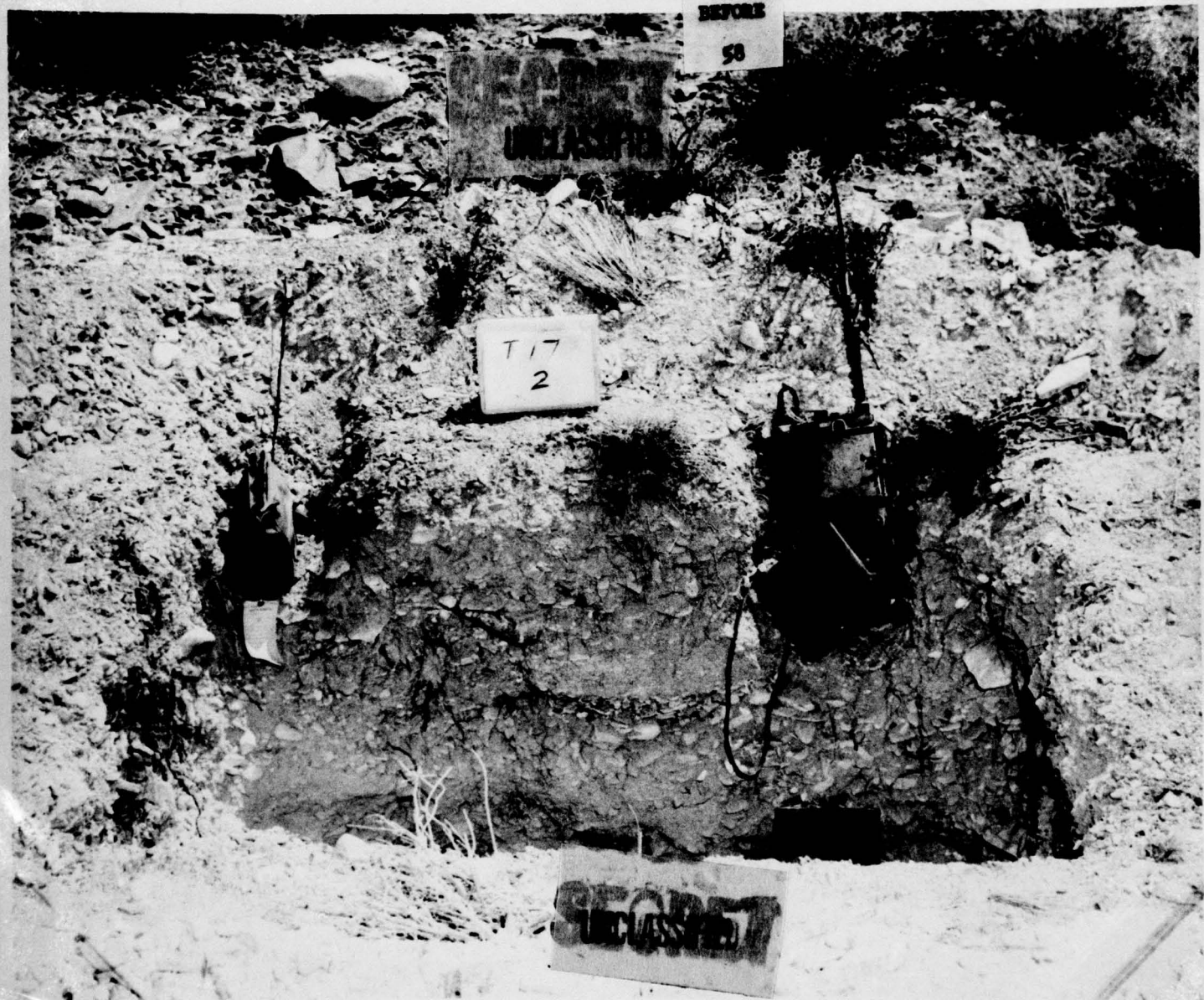
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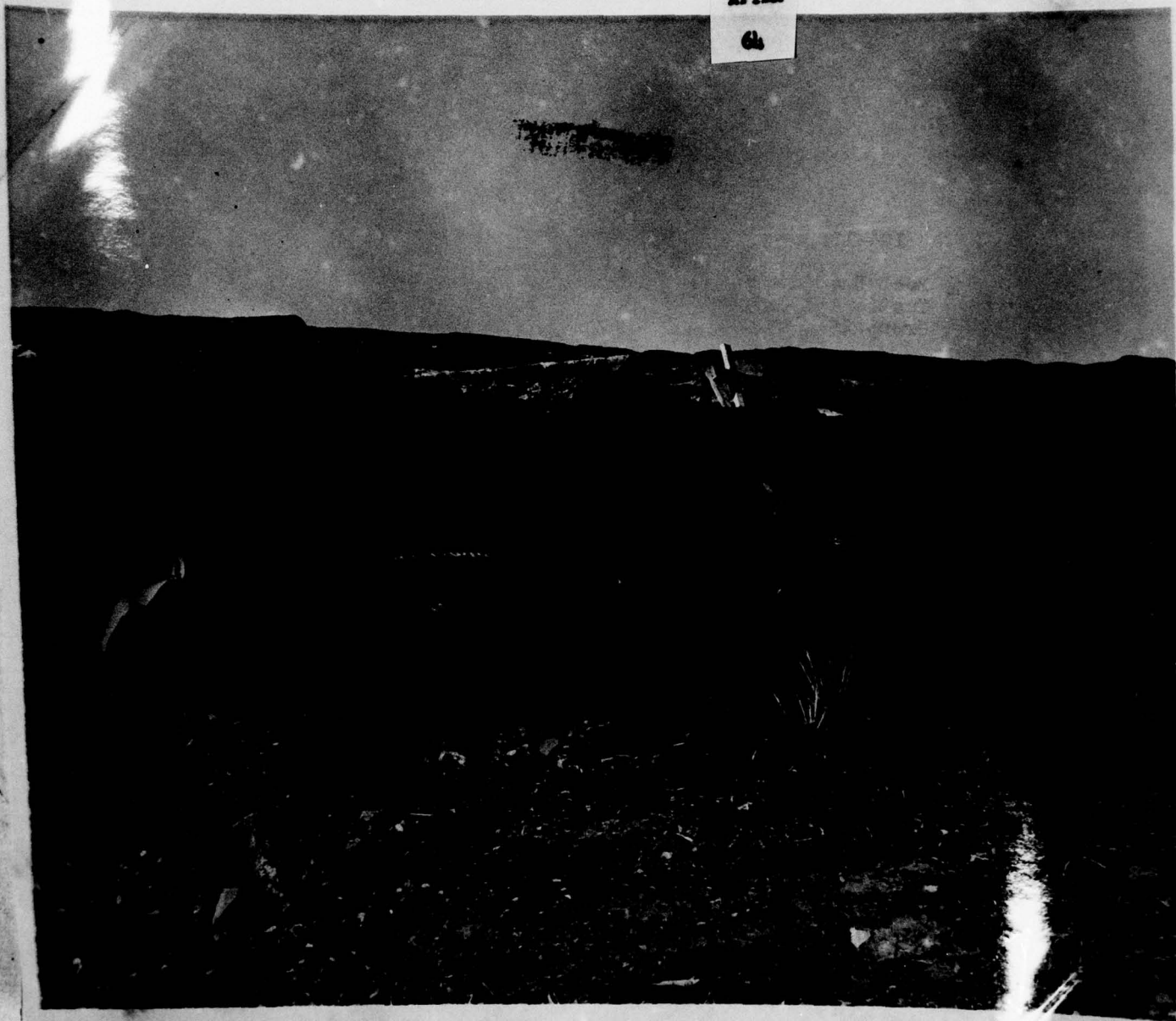
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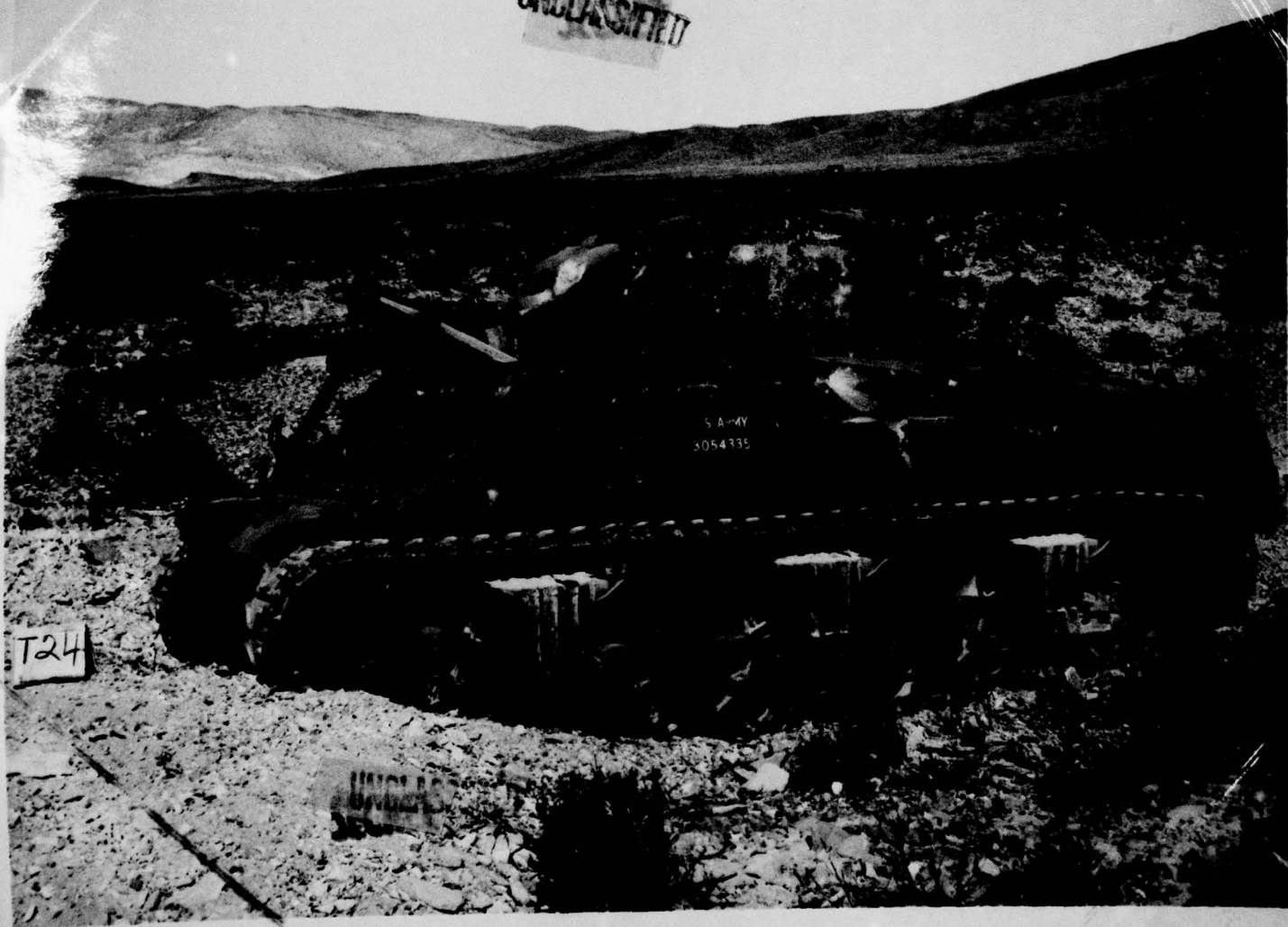
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